

IFC



2018 GROUP A PUBLIC COMMENT AGENDA

OCTOBER 24 - 31, 2018
GREATER RICHMOND CONVENTION CENTER
RICHMOND, VA

2018 Public Comment Agenda

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PRINTED IN THE USA

F4-18 Part I

IFC: 202 (New)

Proposed Change as Submitted

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

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IBC-FS COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Fire Code

Add new definition as follows

LIFE SAFETY SYSTEMS. Systems, devices, and equipment that enhance or facilitates evacuation, smoke control, compartmentation, and/or isolation.

Reason: The intent of this code change proposal is to define the term “life safety system”. The subject term is used in the title of IFC Chapter 9, Fire Protection and Life Safety Systems and throughout Chapter 9 but is not defined. In addition, the term “fire protection system” is defined; however, “life safety system is not.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is a definition and will not affect the cost of construction.

F4-18 Part I

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. This is also consistent with the action taken on Part II by the IBC Fire Safety Committee. (Vote: 14-0)

Assembly Action:

None

F4-18 Part I

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Disapprove.

Commenter's Reason: A definition is needed for life safety systems, but this definition uses terms that do not correlate well within the IBC and IFC. One example is how "compartmentation" is used in the definition. Compartmentation is used in the IBC and IFC, but in different chapters. Where Ch. 9 has life safety systems in the title, the only reference for compartments, more specifically smoke compartments comes from Ch 4 (422.3) of the IBC and the construction requirements are in Ch. 7. A user of the code will see that Ch. 9 is the chapter for life safety systems and not find all of the requirements correlated.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. While there is value in this definition, it will blur passive, active and life safety system requirements and the application of the code.

F4-18 Part I

F4-18 Part II

IBC: 202 (New)

Proposed Change as Submitted

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

2018 International Building Code

Add new definition as follows

LIFE SAFETY SYSTEMS. Systems, devices, and equipment that enhance or facilitates evacuation, smoke control, compartmentation, and/or isolation.

Reason: The intent of this code change proposal is to define the term “life safety system”. The subject term is used in the title of IFC Chapter 9, Fire Protection and Life Safety Systems and throughout Chapter 9 but is not defined. In addition, the term “fire protection system” is defined; however, “life safety system is not.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
This is a definition and will not affect the cost of construction.

F4-18 Part II

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: The term is used throughout the code. The definition is needed. (Vote 11-3)

Assembly Action:

None

F4-18 Part II

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests Disapprove.

Commenter's Reason: A definition is needed for life safety systems, but this definition uses terms that do not correlate well within the IBC and IFC. One example is how "compartmentation" is used in the definition. Compartmentation is used in the IBC and IFC, but in different chapters. Where Ch. 9 has life safety systems in the title, the only reference for compartments, more specifically smoke compartments comes from Ch 4 (422.3) of the IBC and the construction requirements are in Ch. 7. A user of the code will see that Ch. 9 is the chapter for life safety systems and not find all of the requirements correlated.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. While there is value in this definition, it will blur passive, active and life safety system requirements and the application of the code.

F4-18 Part II

F8-18

IFC: 304, 304.4

Proposed Change as Submitted

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Suburban Exterior Fire Work Group (mdobson@vinylsiding.org); Richard Swan, International Association of Fire Fighters, representing International Association of Fire Fighters (rswan@iaff.org)

2018 International Fire Code

Revise as follows

SECTION 304 COMBUSTIBLE WASTE AND LANDSCAPING MATERIAL

Add new text as follows

304.4 Mulch. Combustible landscaping mulch shall not be placed within 3 feet of combustible walls, roofs, or other combustible components of Group R buildings of Type V construction.

Reason: Over the past code cycles there has been concern over smoker habits, combustible mulch, and the potential hazard they pose with combustion of exterior walls. The Suburban Exterior Fire Work Group, a group of fire service members, UL fire fighter safety institute, and other material stakeholders has been focused on this issue over the past 18 months.

The problem identified is the spread of fire from the exterior into to the unprotected attic space and then spreading quickly to other parts of the building.

The group has taken a 3 prong approach to address the issue:

1. Regulate the human risk by prohibiting smoking near exterior doors.
2. Remove combustible material/mulch from near the outside of combustible wall assemblies.
3. Create a block to slow down any fires that occur in the above described setting.

Over the decade, fire departments in the Washington, DC region have been confronted with structure fires which have demonstrated a consistent pattern of starting on the outside. These fires have the potential for rapid loss of structural integrity and catastrophic collapse before occupants are alerted. As attention has grown locally, it is apparent that this type of fire is becoming common on a national basis.

These fires tend to follow a distinct pattern. These fires start at a low point on the exterior and spread vertically along the exterior wall producing flammable gases, which are readily admitted into the attic area through ventilation soffits. If not cooled, these heated gases accumulate and combust, creating rapidly spreading fire conditions in the attic area, often without occupant awareness. The unchecked fire often results in full roof involvement, creating a dangerous and difficult situation for occupants and fire fighters.

The group examined a number of structure fires which have exhibited the pattern described above. There is agreement over 3 common aspects. First, these fires often result from careless smoking habits. Second, when the smoking materials are not properly disposed of, they often come into contact with combustible materials adjacent to a building and, very commonly, this is mulch. And, last, the combustible exterior wall is a factor in the the growth of these fires into the attic space.

The careless smoker is an impediment to effective fire prevention efforts. The fire service has consistently provided data that shows smoking is the leading cause of fatal fires in the United States. Public fire and life safety efforts have been reasonably effective at communicating the message to not smoke in bed, and various medical organizations have demonstrated the health risk associated with "second hand" smoke. We now see that people are routinely smoking outside, at or near the entrance to a building, which increases the possibility of an accidental ignition of outside combustibles. If one were to chronicle the actions of today's smoker, it would likely show the last action they take when exiting a building is to "light up." When returning inside, they often drop the cigarette near the entrance. Many smokers seem to believe that dropping a match or cigarette onto the ground or into a flower pot is an effective method of extinguishment, however, this behavior often places the smoking material directly into the mulch, initiating the low fire described earlier.

Mulch has become a common exterior decorative material which aids in suppressing weed growth while enhancing a building's curb appeal. However, most mulch is a dead organic material, comprised of chipped wood, tree bark or pine needles. Mulch is most effective when it is maintained in a moist state, however it can dry out very quickly and become a readily ignitable fuel source. Because of its relatively small mass in comparison to its surface area, when ignited, it will progress and sustain open flame.

The group discussed a method in which to proceed, the interest being to address, in the quickest manner, industrial and social changes which could reduce the possibility of a fire on the outside of a building. Each aspect presents unique challenges for fire prevention efforts:

1. Changing the behavior of the smoker is an ongoing and difficult challenge, especially as social pressures have resulted in regulatory changes to require people to smoke outside of a building. Further development of the "fire safe" cigarette, by way of testing using mulch, could be deemed too costly for the industry, and would have no effect on improper disposal of matches. Thus, the quickest and most practical strategy for this aspect of the problem is to expand public fire and life safety education to focus on the hazards of improper disposal of smoking materials, coupled with enforcement of applicable requirements for regulation of smoking and disposal of products. However, in this age of "information overflow" it is questionable if this would result in widespread behavioral changes for smokers.
2. Regulating the use and placement of mulch, that the study group believes could have the quickest and most significant impact toward reducing the exterior fire problem, while additional strategies to address the other problems noted are pursued.

The use of wood and wood related mulch for building decoration is purely optional. It is not a required construction component under current building codes. Therefore, regulations to curtail its use or require that it be separated from a building's combustible exterior are reasonable and could be codified on a national basis. On a large scale, the mere action of creating separation of combustible materials has been a wildland fire tactic for years. Several states and local jurisdictions have already employed this theory by either recommending or requiring that wood-based mulch be separated from exterior combustible walls:

1. The Virginia Department of Forestry recommends to "provide a minimum of an 18 inch clearance between landscaping mulch beds and combustible building materials" and to "ensure proper clearance to electric devices, such as decorative lights, by following the manufacturer's instructions;"
2. In Raleigh, NC, following a disastrous fire in a multi-family building, the city passed a pine straw mulch ordinance that bans the use of pine straw as ground cover within 10 feet of multi-family dwellings. The ordinance exempts 1 and 2-family dwellings, however, the city strongly encourages these homeowners to comply with the pine straw restrictions;
3. The Commonwealth of Massachusetts prohibits the new application of mulch within 18 inches around combustible exteriors of buildings, such as wood or vinyl but not brick or concrete. Residential buildings with six units or less are exempted from this regulation, but it is recommended that all homeowners adopt these safety practices. The regulation applies to all other buildings including commercial properties.
4. Ventura County, CA prohibits mulch and wood chips within the required "defensible space" zone (which ranges from 0' to 30' from the exterior of a building).

This small sampling of jurisdictions has produced enough evidence to lead the study group to suggest the possible introduction of a code proposal to require separation, or non-application, of wood-based mulch in proximity to combustible exterior walls.

The proposed protected soffit approach will require a form of blocking outside of exterior doorways and garage doors. These proposed material have been required in North Carolina for over 5 years and are accepted to provide some form of blocking that will slow down the movement of fire from the outside to the attic space, effectively helping to address the issue and allow fire service more time put out the fire.

We think this approach is effective, efficient, and cost effective.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change should not impact the cost of construction.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the definition of mulch varies by location. They also had concerns with the distance requirement, occupancy group and the difficulty with enforcement. (Vote: 13-1)

Assembly Action:

None

F8-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Matthew Dobson, representing Suburban Exterior Fire Work Group (mdobson@vinylsiding.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

Add new definition as follows:

COMBUSTIBLE LANDSCAPING MULCH. A layer of combustible material applied to the exterior ground surface for the conservation of soil moisture, improving fertility and health of the soil, reducing weed growth and enhancing the visual appeal of the area.

304 COMBUSTIBLE WASTE AND LANDSCAPING MATERIAL

304.4 Combustible Landscaping Mulch. Combustible landscaping mulch adjacent to buildings of Type V construction shall not be placed within 3 feet of combustible ~~walls~~ exterior wall coverings, decks, roofs, or other combustible components of Group R buildings of Type V construction.

Commenter's Reason: The committee seemed interested in this change but was concerned because there was no definition for mulch, needed a better justification for 3-foot distance, wanted to include all occupants groups, and questioned how enforcement would occur.

This comment has addressed the concerns of the fire code committee.

The issue of concern is mulch fires, generally started by discarded cigarettes, starting on the outside of buildings and growing and moving up into the attic space causing major fires.

In a recent report from NFPA on Virginia, the leading cause of fire fatalities in 2018 so far is improperly discarded cigarettes. This change will help address parts of this problem. Also, a recent report out of Alberta, indicates similarly that poor disposal of smoking materials caused a majority of serious fires in 2018.

In a review of current mulch regulations in place from Massachusetts to North Carolina, the average distance to keep mulch away from buildings is three feet. The proposal would require mulch be at least three feet from exterior combustible components of Type V construction.

Enforcement can easily become a part of the inspections now conducted on exterior fire safety features and Chapter 1 provides adequate information on how to regulate and enforce this requirement.

These requirements can be easily incorporated in the initial development plans and building plans which in many cases include landscaping plans.

Here are some additional examples of why this requirement is necessary.

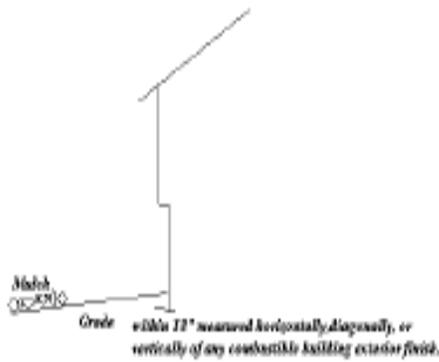
- A mulch fire in Massachusetts occurred in May 2015 in a large Arlington apartment complex. One man died in the fire started by smoking materials discarded in a mulch bed, which spread to a car, then to the building. Thirty-six apartments and six cars were destroyed. The building had no sprinklers, and the estimated dollar loss was \$6.7 million.
- In April 2012, improperly discarded smoking materials ignited mulch outside an assisted living center in Braintree. The fire forced many older adults to evacuate in the early morning hours. Several suffered smoke inhalation injuries.
- In May 2008, a cigarette ignited a mulch fire at a Peabody apartment complex. It caused \$6.7 million in damage to the building, displaced 750 people temporarily and 36 permanently.

Here are some examples of currently in place ordinance and information:

10.14.10.4.1 Mulch shall not be newly applied within 18 inches of any combustible portion of any building [See Figure 10.14.10.4.1(a)]. Exception: Any building, regardless of the existence of fire separations, containing six dwelling units or less.

10.14.10.4.2 Mulch as used here shall mean any type of forest material that is produced for the purpose spreading or application over the surface of the soil as a protective cover, to retain moisture, reduce erosion, provide nutrients, suppress weed growth, seed germination and for general landscaping purposes.

Figure 10.14.10.4.1(a)



The state of Massachusetts does not allow mulch within 18 of combustible portion of buildings.

Raleigh, NC/Durham here is a photo of what would not be allowed according to an ordinance in North Carolina.



Carrboro, NC - here is excerpted text from Carrboro, NC.

Section 12-17 Mulch Piles and Pine Straw (Amend. 11/18/08)

(a) No person may cause, suffer, or permit any mulch pile to be created or maintained on any premises if such mulch pile (i) is larger than eight feet in height, or (ii) covers more than 400 square feet of ground area.

(b) Any mulch pile for which a permit is required under Section 105.6.47 (i.e. one comprising 200 cubic feet or more) shall be separated from any other mulch pile for which such a permit is required by a distance of at least fifty feet. In addition, each such pile must be accessible by an approved fire apparatus access road capable of withstanding the imposed loads of a fire truck (60,000 lbs.) and have an all-weather driving surface.

(c) No pine straw or any other decorative ground cover or material with a fire rate of spread more than 12 inches per minute shall be placed, kept, or stored within ten feet of any building with combustible exterior construction and/or combustible doors, windows or other openings. This subsection shall apply to all buildings with combustible exterior construction in existence upon the effective date hereof, upon thirty (30) days notice hereof, and to all new construction with combustible exteriors.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

It is hard to estimate the increase or decrease in cost. In the short term there may be some increase depending on what the building owner decides to use instead of combustible mulch. Longer term the maintenance costs may go down as less mulch may be used.

F13-18

IFC: 310.9

Proposed Change as Submitted

Proponent: Matthew Dobson, Vinyl Siding Institute, representing Suburban Exterior Fire Work Group (mdobson@vinylsiding.org); Richard Swan, representing International Association of Fire Fighters (rswan@iaff.org)

2018 International Fire Code

Add new text as follows

310.9 Group R. Smoking shall be prohibited within 25 feet of any exterior door of Group R buildings of Type V construction.

Reason: Over the past code cycles there has been concern over smoker habits, combustible mulch, and the potential hazard they pose with combustion of exterior walls. The Suburban Exterior Fire Work Group, a group of fire service members, UL fire fighter safety institute, and other material stakeholders has been focused on this issue over the past 18 months.

The problem identified is the spread of fire from the exterior into to the unprotected attic space and then spreading quickly to other parts of the building.

The group has taken a 3 prong approach to address the issue:

1. Regulate the human risk by prohibiting smoking near exterior doors.
2. Remove combustible material/mulch from near the outside of combustible wall assemblies.
3. Create a block to slow down any fires that occur in the above described setting.

The proposed protected soffit approach, contained in a proposal for the IBC, will require a form of blocking outside of exterior doorways and garage doors in the soffit area. These proposed material have been required in North Carolina for over 5 years and are accepted to provide some form of blocking that will slow down the movement of fire from the outside to the attic space, effectively helping to address the issue and allow fire service more time put out the fire. Testing on these protected soffits are currently underway to show the effectiveness of these assemblies both vented and unvented.

Over the decade, fire departments in the Washington, DC region have been confronted with structure fires which have demonstrated a consistent pattern of starting on the outside. These fires have the potential for rapid loss of structural integrity and catastrophic collapse before occupants are alerted. As attention has grown locally, it is apparent that this type of fire is becoming common on a national basis.

These fires tend to follow a distinct pattern. These fires start at a low point on the exterior and spread vertically along the exterior wall producing flammable gases, which are readily admitted into the attic area through ventilation soffits. If not cooled, these heated gases accumulate and combust, creating rapidly spreading fire conditions in the attic area, often without occupant awareness. The unchecked fire often results in full roof involvement, creating a dangerous and difficult situation for occupants and fire fighters.

The group examined a number of structure fires which have exhibited the pattern described above. There is agreement over 3 common aspects. First, these fires often result from careless smoking habits. Second, when the smoking materials are not properly disposed of, they often come into contact with combustible materials adjacent to a building and, very commonly, this is mulch. And, last, the combustible exterior wall is a factor in the the growth of these fires into the attic space.

The careless smoker is an impediment to effective fire prevention efforts. The fire service has consistently provided data that shows smoking is the leading cause of fatal fires in the United States. Public fire and life safety efforts have been reasonably effective at communicating the message to not smoke in bed, and various medical organizations have demonstrated the health risk associated with "second hand" smoke. We now see that people are routinely smoking outside, at or near the entrance to a building, which increases the possibility of an accidental ignition of outside combustibles. If one were to chronicle the actions of today's smoker, it would likely show the last action they take when exiting a building is to "light up." When returning inside, they often drop the cigarette near the entrance. Many smokers seem to believe that dropping a match or cigarette onto the ground or into a flower pot is an effective method of extinguishment, however, this behavior often places the smoking material directly into the mulch, initiating the low fire described earlier.

Mulch has become a common exterior decorative material which aids in suppressing weed growth while enhancing a building's curb appeal. However, most mulch is a dead organic material, comprised of chipped wood, tree bark or pine needles. Mulch is most effective when it is maintained in a moist state, however it can dry out very quickly and become a readily ignitable fuel source. Because of its relatively small mass in comparison to its surface area, when ignited, it will progress and sustain open flame.

The group discussed a method in which to proceed, the interest being to address, in the quickest manner, industrial and social changes which could reduce the possibility of a fire on the outside of a building. Each aspect presents unique challenges for fire prevention efforts:

1. Changing the behavior of the smoker is an ongoing and difficult challenge, especially as social pressures have resulted in regulatory changes to require people to smoke outside of a building. Further development of the "fire safe" cigarette, by way of testing using mulch, could be deemed too costly for the industry, and would have no effect on improper disposal of matches. Thus, the quickest and most practical strategy for this aspect of the problem is to expand public fire and life safety education to focus on the hazards of improper disposal of smoking materials, coupled with enforcement of applicable requirements for regulation of smoking and disposal of products. However, in this age of "information overflow" it is questionable if this would result in widespread behavioral changes for smokers;
2. Regulating the use and placement of mulch, that the study group believes could have the quickest and most significant impact toward reducing the exterior fire problem, while additional strategies to address the other problems noted are pursued.

The use of wood and wood related mulch for building decoration is purely optional. It is not a required construction component under current building codes. Therefore, regulations to curtail its use or require that it be separated from a building's combustible exterior are reasonable and could be codified on a national basis. On a large scale, the mere action of creating separation of combustible materials has been a wildland fire tactic for years. Several states and local jurisdictions have already employed this theory by either recommending or requiring that wood-based mulch be separated from exterior combustible walls:

1. The Virginia Department of Forestry recommends to "provide a minimum of an 18 inch clearance between landscaping mulch beds and combustible building materials" and to "ensure proper clearance to electric devices, such as decorative lights, by following the manufacturer's instructions;"
2. In Raleigh, NC, following a disastrous fire in a multi-family building, the city passed a pine straw mulch ordinance that bans the use of pine straw as ground cover within 10 feet of multi-family dwellings. The ordinance exempts 1 and 2-family dwellings, however, the city strongly encourages these homeowners to comply with the pine straw restrictions;
3. The Commonwealth of Massachusetts prohibits the new application of mulch within 18 inches around combustible exteriors of buildings, such as wood or vinyl but not brick or concrete. Residential buildings with six units or less are exempted from this regulation, but it is recommended that all homeowners adopt these safety practices. The regulation applies to all other buildings including commercial properties.
4. Ventura County, CA prohibits mulch and wood chips within the required "defensible space" zone (which ranges from 0' to 30' from the exterior of a building).

This small sampling of jurisdictions has produced enough evidence for a code proposal to require separation, or non-application, of wood-based mulch in proximity to combustible exterior walls.

We think this approach is effective, efficient, and cost effective.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change is intended to modify human behavior and will not impact the cost of construction.

F13-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that, similar to F8-18, they had concerns with the distance requirement, occupancy group and the difficulty with enforcement. (Vote: 14-0)

Assembly Action:

None

F13-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Matthew Dobson, representing Suburban Exterior Fire Work Group (mdobson@vinylsiding.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

310.9 ~~Group R~~ Type V construction. Smoking shall be prohibited within 25 feet of any exterior door of ~~Group R~~ buildings of Type V construction.

Commenter's Reason: The fire code committee noted their reason for disapproval was that it needed more reason for the 25 foot, it wanted the occupancy provision removed as it should apply to all occupancies, and it was concerned about enforcement of the rule.

This substantiation and modification to language have addressed the committee concerns.

This change would apply to all types of occupancies of Type V construction.

It s worth also noting that In a recent report from NFPA on Virginia, the leading cause of fire fatalities in 2018 so far is improperly discarded cigarettes. This change will help address parts of this problem. Also, a recent report out of Alberta, indicates similarly that poor disposal of smoking materials caused a majority of serious fires in 2018.

In a review of the fire code, the 25-foot distance has precedence and is appropriate. In the International Fire Code a 25-foot distance for smoking distance and recreational fires are specifically regulated in the following sections:

- 307.4.2 Location of recreational fires to buildings and combustible material
- 3703 smoking near combustible fibers section
- 5003.7.1 smoking near hazardous materials
- 5706.2.8 Smoking near flammable and combustible liquids
- 6107.2 Smoking LP filling operations

These current similar rules are in place.

Current enforcement of this new regulation would be handled similarly to how the above existing regulations are enforced. Also, building owners could create enforcement tools through signage, lease agreements, and other forms of occupant education.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This regulation will impact human behavior and will not have an impact on the cost of construction.

F13-18

F17-18

IFC: 315.3.2, 1031.2, 3311.3

Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2018 International Fire Code

Revise as follows

315.3.2 Means of egress. Combustible materials shall not be stored in *exits, fire-resistance-rated corridors 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.

1031.2 Reliability. Required *exit accesses, exits and exit discharges* shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the *means of egress* is occupied. An *exit, fire-resistance-rated corridor or exit passageway* shall not be used for any purpose that interferes with a *means of egress*.

3311.3 Storage. Combustible materials associated with construction, demolition, remodeling or alterations to an occupied structure shall not be stored in *exits, fire-resistance-rated corridors, 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.

Reason: This proposal is intended to correct an anomaly that occurred when two unrelated proposals by different submitters collided in impact when the 2012 codes were printed and causes some to believe fire-resistance-rated corridors are not "exits".

I had submitted a proposal that included modifying then Section 1030.2, (now 1031.2), by taking language that existed in other portions of Chapter 10 and adding them to 1030.2 since the requirements were ones that not only applied at the time of construction, but must be maintained for the life of the building or structure. (Proposal F172-09/10 attached).

The International Fire Code Development Committee approved the proposal.

The main premise was protecting "exits" and including existing language that stated "An exit or exit passageway shall not be used for any purpose other than as a means of egress."

At the time my proposal was submitted and approved the definition of exit in the code was:

"EXIT. *That portion of a means of egress system which is separated from other interior spaces of a building or structure by fire-resistance-rated construction and opening protectives as required to provide a protected path of egress travel between the exit access and the exit discharge . Exits include exterior exit doors at the level of exit discharge , vertical exit enclosures , exit passageways , exterior exit stairways , exterior exit ramps and horizontal exits.*

That definition included fire-resistance-rated corridors by virtue of the first sentence and represented what historically was considered an exit.

Unfortunately during that cycle a separate proposal in front of another committee included a proposal that changed the definition of an exit to:

"EXIT. *That portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways, interior exit ramps, exit passageways, exterior exit stairways and exterior exit ramps and horizontal exits."*

The definition currently reads:

"[BE] EXIT. *That portion of a means of egress system between the exit access and the exit discharge or public way. Exit components include exterior exit doors at the level of exit discharge, interior exit stairways and ramps, exit passageways, exterior exit stairways and ramps and horizontal exits.*

[BE] EXIT ACCESS. That portion of a means of egress system that leads from any occupied portion of a building or structure to an exit."

Because of the new definition and some language in the commentary generically referring to corridors as exit access, it is no longer clear if a fire-resistance-rated corridor is included in the two fire code sections addressing exits as intended by the proposal approved by the committee. The need to protect a fire-resistant-rated corridor is as important as protecting an exit passageway and other types of exits as documented by the following section:

"[BE] 1020.6 Corridor continuity. *Fire-resistance-rated corridors shall be continuous from the point of entry to an exit, and shall not be interrupted by intervening rooms. Where the path of egress travel within a fire-resistance-rated corridor to the exit includes travel along unenclosed exit access stairways or ramps, the fire-resistance-rating shall be continuous for the length of the stairway or ramp and for the length of the connecting corridor on the adjacent floor leading to the exit.*

Exceptions:

1. *Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.*
2. *Enclosed elevator lobbies as permitted by Item 1 of Section 1016.2 shall not be construed as intervening rooms."*

By adding the wording "fire-resistance-rated corridor" to the two sections in this proposal the intent of the committee approval of F172-09/10 will be met.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Since this proposal addresses a topic that deals with maintenance of a exit path during day to day activities, it does not impact the cost of construction.

Analysis: Note that this proposal includes sections that are part of an errata to the 2018 IFC. Section 315.3.2 the second sentence is new and Section 3311.3 is a new section to the 2018 that was inadvertently missed during publication.

F17-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that there are issues regarding the definition and interpretation of combustible storage, temporary vs. permanent, and rooms that are open to the corridor. (Vote: 9-5)

Assembly Action:

None

F17-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)requests As Submitted.

Commenter's Reason: The reason for disapproval was as follows:
"The committee stated that there are issues regarding the definition and interpretation of combustible storage, temporary vs. permanent, and rooms that are open to the corridor. (Vote: 9-5)"

The issues are perplexing because this concepts was already approved via F151-09/10 and did not occur because of a unrelated proposal in front of another committee changing the definition of exit.

Combustible Storage is currently part of the code and currently applied to other fire-resistance rated egress components without difficulties.

Similarly there are no problems being raised about temporary versus permanent with those means of egress components.

And rooms permitted to be open to corridors are specific activities that do not include storage. Specifically Section 1020.6 Corridor Continuity, Exception 1. Foyers, lobbies or reception rooms constructed as required for corridors shall not be construed as intervening rooms.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This proposal does not involve construction activities. It regulates use of spaces already constructed.

F17-18

F18-18

IFC: 315.8 (New); IBC: [F] 307.1, [F]307.4

Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Tesla, USA (rjd@davidsoncodeconcepts.com)

2018 International Fire Code

Add new text as follows

315.8 Used or Off Specification Lithium-Ion Batteries. The storage of used or off specification lithium-ion batteries shall comply with the following as appropriate:

1. Gathering locations in occupancies other than those involving Mercantile occupancy battery recycling activities shall comply with Section 315.8.1.
2. Mercantile occupancy battery sale recycling activities shall comply with Section 315.8.2.
3. Indoor collection and storage activities exceeding the limitations of Sections 315.8.1 or Section 315.8.2 occurring in mixed occupancy buildings shall comply with Section 315.8.3.
4. Indoor storage and recycling activities in detached buildings shall comply with Section 315.8.4.
5. Outdoor storage shall comply with Section 315.8.5.

315.8.1 Gathering locations. Indoor storage of used and off specification lithium-ion batteries being gathered for shipment to recycling facilities shall be in rooms or spaces protected by an automatic sprinkler system complying with Section 903.3.1.1. Batteries quantities shall not exceed one cubic ft. (0.03 m³) per fire area, and the batteries shall be stored in open top noncombustible containers spaced a minimum 3 ft. (914 mm) from combustible materials and a minimum 10 feet (3048 mm) from exits from the room, space or building.

315.8.2 Mercantile battery sale recycling locations. Rooms or spaces associated with mercantile battery sale recycling activities shall not exceed 100 sq. ft. in size. The rooms or spaces shall be separated from the remainder of the building areas by two-hour fire barriers constructed in accordance with Section 707 of the International Building Code and two-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, as appropriate. The room or space shall be protected by a radiant-energy detection system installed in accordance with NFPA 72 and shall be protected by an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1.

315.8.3 Indoor storage in mixed occupancies. Mixed occupancy indoor storage and recycling activities not meeting the limitations of Section 315.8.1 or Section 315.8.2 shall be classified as a Group H-2 occupancy and shall be in rooms or spaces not exceeding 5000 sq. ft. (464 m²) in area separated from the remainder of the building areas by three-hour fire barriers constructed in accordance with Section 707 of the International Building Code and three-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, as appropriate.

Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³) with a 5 foot separation to the next pile. Piles shall not be located within 10 feet of exits from the room, space or building.

315.8.3.1 Prevention and Mitigation. Occupancies storing used or off specification lithium-ion batteries shall have a plan approved by the fire code official that provides for the prevention of fire incidents and includes early detection mitigation measures.

315.8.3.2 Fire detection. The room or space shall be protected by a radiant-energy detection system installed in accordance with Section 907.

315.8.3.3 Fire suppression. The building the battery storage is located in shall be provided with an automatic fire suppression system installed in accordance with Section 903.1.1. The Group H-2 battery storage room or space shall be protected by a NFPA 15 water spray automatic suppression system installed in accordance with Section 904.12 with a density based on large scale fire testing complying with Section 1206.2.11.

315.8.3.4 Explosion protection. Explosion protection shall be installed in accordance with Section 911.

315.8.4 Detached buildings. Indoor storage and recycling activities shall be permitted in Group H-2 detached buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards. The storage shall comply with the following:

1. Individual rooms or areas inside the building shall not exceed 7,000 sq ft (650 m²) and shall be are separated from other areas by three hour fire barriers constructed in accordance with Section 707 of the International Building Code and three-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, as appropriate.
2. The building shall be protected by a radiant-energy detection system installed in accordance with Section 907.
3. Any area containing lithium-ion batteries shall be protected by a NFPA 15 water spray automatic suppression system installed in accordance with Section 904.12 with a density based on large scale fire testing complying with Section 1206.2.11.
4. Explosion protection shall be installed in accordance with Section 911.
5. Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³) with a 5 foot separation to other piles, walls, appliances and equipment. Piles shall not be located within 10 feet of exits from the room, space or building. There shall be no more than 64 piles per room or space.
6. A plan approved by the fire code official that provides for the prevention of fire incidents and includes early detection mitigation measures.

315.8.5 Outdoor storage. Outdoor storage shall comply with the following:

1. Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³).
2. Piles located outdoors shall be separated by a minimum 100 feet (30.5 M) from the following exposures:
 - 2.1 Lot lines
 - 2.2 Public ways
 - 2.3 Buildings
 - 2.4 Stored combustible materials
 - 2.5 Hazardous materials
 - 2.6 High-piled stock
 - 2.7 Other exposure hazards

Exception: Clearances are permitted to be reduced to 3 ft. (914 mm) when a 3-hour free standing fire barrier, suitable for exterior use, and extending 15 ft. (1.5 m) above and extending 15 ft (1.5 m) beyond the physical boundary of the pile is provided to protect the exposure.

2018 International Building Code

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in *control areas* complying with Section 414, based on the maximum allowable quantity limits for *control areas* set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the International Fire Code. Hazardous materials stored, or used on top of roofs or canopies, shall be classified as outdoor storage or use and shall comply with the International Fire Code.

Revise as follows

{F} 307.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).

Combustible dusts 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 414.1.3.

Cryogenic fluids, flammable.

Flammable gases.

Organic peroxides, Class I.

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).

Pyrophoric liquids, solids and gases, nondetonable.

Storage of used or off specification lithium-ion batteries in mixed use or detached buildings shall be in accordance with Section 315.8 of the International Fire Code.

Unstable (reactive) materials, Class 3, nondetonable.

Water-reactive materials, Class 3.

Reason: Lithium-ion batteries have significant fire and explosion hazards and there have been some serious fires and explosions associated with storage of used batteries in recycling and disposal facilities, including a serious event in Hilden Germany that seriously injured three fire fighters.

This proposal adds requirements for protecting storage of lithium-ion batteries being stored on premise prior to sending to recycling or disposal facilities, and for storage at recycling or disposal facilities. The requirements are broken down to address those with a small collection area, mercantile occupancies that have collection areas for returned batteries, storage at recycling or disposal facilities in mixed use buildings and storage at recycling or disposal facilities in detached buildings. The hazard is addressed by adding requirements for fire protection features, amounts that can be present, and fire-resistant construction separation. The larger areas permitted for storage at recycling or disposal facilities in mixed use and detached buildings will be classified as an H-2 Group. The outdoor storage setback requirements are consistent with setback requirements for outdoor electrochemical energy storage system installations.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. However this will limit the facilities where used or off specification lithium-ion batteries can be stored.

F18-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that there are issues with the package and container types, thermal runaway, ignition potential, unlimited area buildings, the relation to IBC incidental use and gathering areas to occupancy group. (Vote: 13-1)

Assembly Action:

None

F18-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O Brian, FCAC, representing FCAC (fcac@iccsafe.org) ; Robert Davidson, Davidson Code Concepts, LLC, representing Tesla USA/PRBA (rjd@davidsoncodeconcepts.com) requests As Modified by This Public Comment requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

OFF SPECIFICATION BATTERY OR CELL .

A cell or battery that has been tested during the manufacturing quality control process and found not to be within the manufacturer's designed set of criteria for its intended use

315.8 Used or Off Specification Lithium-Ion Batteries or cells. ~~The Areas associated with the collection or storage of used or off specification lithium-ion batteries or cells shall comply with the following as appropriate provisions of this section and Chapter 32 as applicable.~~

Exceptions:

- ~~1. Gathering locations in occupancies other than those involving Mercantile occupancy battery recycling activities shall comply with Section 315.8.1.~~
- ~~2. Mercantile occupancy battery sale recycling activities shall comply with Section 315.8.2.~~
- ~~3. Indoor collection and storage activities exceeding the limitations of Sections 315.8.1 or Section 315.8.2 occurring in mixed occupancy buildings shall comply with Section 315.8.3.~~
- ~~4. Indoor storage and recycling activities in detached buildings shall comply with Section 315.8.4.~~
- ~~5. Outdoor storage shall comply with Section 315.8.5.~~
1. Areas within a facility that are operated in accordance with procedures that provide for the state of charge of the lithium-ion batteries and cells to be thirty percent or less. The procedures shall be approved by the fire code official.
2. When fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the batteries in storage will be limited to the design area of an automatic sprinkler system installed in accordance with Section 903.3.1.1 and will not adversely impact occupant egress from the building or adversely impact adjacent stored materials or the building structure. The test report shall be provided to the fire code official for review and approval in accordance with Section 104.7.2

**Table 315.8
Collection and Storage Requirements**

Occupancy Type/Location of the Area	Requirements
<u>Collection locations; any occupancy</u>	<u>Section 315.8.1</u>
<u>Mercantile, vehicle repair, aircraft repair and laboratory battery collection and storage locations</u>	<u>Sections 315.8.1 and 315.8.2</u>
<u>Any storage area exceeding the limitations of Section 315.8.1 or 315.8.2 that is located inside a building</u>	<u>Section 315.8.3</u>
<u>Any storage area outside a building</u>	<u>Section 315.8.4</u>

315.8.1 Gathering Collection locations; any occupancy. ~~Indoor storage of used and off-specification lithium-ion batteries being gathered for shipment to recycling facilities shall be in rooms or spaces protected by an automatic sprinkler system complying with Section 903.3.1.1. Batteries quantities~~ All areas located indoors in any occupancy where used batteries are collected from employees or the public shall be provided with open top noncombustible containers or containers approved for battery collection activities. Containers shall not exceed one cubic ft. (0.03 m³) per fire area, and the batteries shall be stored in open top noncombustible containers spaced in size. Containers shall have a minimum 3 ft. (914 mm) of open space from other battery collection containers and combustible materials and shall be located a minimum 10-5 feet (3,048-1,524 mm) from exits from the room, space or building. Where combustible materials are located within the space between collection containers, the containers shall be spaced a minimum 10 feet (3,048 mm) apart.

315.8.2 Mercantile battery sale recycling, vehicle repair, aircraft repair and laboratory occupancy battery collection and storage locations. Batteries collected and stored at mercantile, vehicle repair, aircraft repair or laboratory occupancies other than those in collection containers complying with Section 315.8.1 shall be stored in accordance with one or more of the following methods. Battery terminals shall be protected either through battery design methods or a protective packaging method to prevent short circuit of the battery.

1. In rooms or spaces not exceeding 200 sq. ft. (18.58 m²) in gross floor area ~~Rooms or spaces associated with mercantile battery sale recycling activities shall not exceed 100 sq. ft. in size.~~ The rooms or spaces shall be separated from the remainder of the building areas by ~~two-hour~~ fire barriers with a fire resistance rating of two hours constructed in accordance with Section 707 of the International Building Code and ~~two-hour~~ horizontal assemblies with a fire resistance rating of two hours constructed in accordance with Section 711 of the International Building Code, as appropriate. The room or space shall be protected by a radiant-energy detection system installed in accordance with NFPA 72 and ~~shall be protected by an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1.~~
2. In approved prefabricated portable buildings or containers not exceeding 200 sq. ft. (18.58 m²) in gross floor area that are constructed with two-hour fire-resistance ratings and provided with radiant-energy detection system installed in accordance with NFPA 72 and an approved automatic fire suppression system.
3. In metal drums with batteries separated from each other by vermiculite or other approved material, or in containers approved for battery collection and storage activities. Each area containing such metal drums or approved containers shall not exceed 200 sq. ft. (18.58 m²) in area and shall be separated from other battery storage areas by a minimum of 10 feet (3,048 mm). The collection and storage area shall be protected by a radiant-energy detection system installed in accordance with NFPA 72.
4. In containers approved for use in transportation that will prevent an event from propagating beyond the container. Each area containing the approved transportation containers shall not exceed 200 sq. ft. (18.58 m²) in area and shall be separated from other battery storage areas by a minimum of 10 feet (3,048 mm). The storage area shall be protected by a radiant-energy detection system installed in accordance with NFPA 72.
5. Indoor storage areas meeting the provisions of Section 315.8.3.

315.8.3 Indoor storage in mixed occupancies. ~~Mixed-occupancy indoor storage and recycling activities~~ Indoor storage involving used or off-specification lithium-ion or lithium metal batteries or cells not meeting the limitations of Section 315.8.1 or Section 315.8.2 shall comply with Sections 315.8.3.1 through 315.8.3.4 and shall be classified as a Group H-2 occupancy and 3 occupancy. The battery storage shall be in rooms or spaces not exceeding 5000 sq. ft. (464 m²) in area separated from the remainder other areas of the building areas by three-hour fire barriers constructed with a fire resistance rating of three-hours in accordance with Section 707 of the International Building Code and three-hour horizontal assemblies constructed with a fire resistance rating of three-hours in accordance with Section 711 of the International Building Code, as appropriate. Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³) with a 5-foot separation to the next pile. Piles ~~Batteries and cells shall not be located within 10 feet (3,048 mm) of exits from the room, space or building or space in which they are stored.~~

315.8.3.1 Prevention and Mitigation. ~~Occupancies storing used or off-specification lithium-ion batteries shall have a plan approved by the fire code official. A plan that provides for the prevention of fire incidents and includes early detection mitigation measures shall be provided to the fire code official for approval.~~

315.8.3.2 Fire detection. The room or space shall be protected by a radiant-energy detection system installed in accordance with Section 907.

315.8.3.3 Fire suppression. The building the battery storage is located in shall be provided with an automatic fire suppression system installed in accordance with Section 903.1.1. The Group H-2-3 battery or cell storage room or space shall be protected by a NFPA 15 water spray automatic suppression system installed in accordance with Section 904.12 with a density based on large scale fire testing complying with Section 1206.2.11.

315.8.3.4 Explosion protection. ~~Explosion protection.~~ The rooms and spaces occupied for the battery or cell storage shall be provided with explosion protection installed in accordance with Section 911.

315.8.4 Detached buildings. ~~Indoor storage and recycling activities shall be permitted in Group H-2 detached buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards. The storage shall comply with the following:~~

- ~~1. Individual rooms or areas inside the building shall not exceed 7,000 sq ft (650 m²) and shall be separated from other areas by three-hour fire barriers constructed in accordance with Section 707 of the International Building Code and three-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, as appropriate.~~
- ~~2. The building shall be protected by a radiant-energy detection system installed in accordance with Section 907.~~
- ~~3. Any area containing lithium-ion batteries shall be protected by a NFPA 15 water spray automatic suppression system installed in accordance with Section 904.12 with a density based on large-scale fire testing complying with Section 1206.2.11.~~
- ~~4. Explosion protection shall be installed in accordance with Section 911.~~
- ~~5. Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³) with a 5-foot separation to other piles, walls, appliances and equipment. Piles shall not be located within 10 feet of exits from the room, space or building. There shall be no more than 64 piles per room or space.~~
- ~~6. A plan approved by the fire code official that provides for the prevention of fire incidents and includes early detection mitigation measures.~~

315.8.54 Outdoor storage location. Outdoor storage shall comply with the following:

1. Individual pile sizes shall be limited to sixty-four cubic ft. (1.81 m³) 200 square feet (18.58 m²) in area separated from other piles by 10 feet (3,048 mm).
2. Piles located outdoors shall be separated by a minimum 100-20 feet (30.5 M-914 mm) from the following exposures:
 - 2.1. Lot lines
 - 2.2. Public ways
 - 2.3. Buildings
 - 2.4. ~~Stored combustible materials~~ Other storage
 - 2.5. Hazardous materials
 - 2.6. ~~High-piled stock~~
 - 2.7-2.6 Other exposure hazards

Exception: Clearances are permitted to be reduced to not less than 3 ft. (914 mm) when a 3-hour free standing fire barrier, suitable for exterior use, and extending 15 ft. (1.5 m) above and extending 15 ft. (1.5 m) beyond the physical boundary of the pile is provided to protect the exposure.

2018 International Building Code

[F] 307.1 High-hazard Group H. High-hazard Group H occupancy includes, among others, the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation or storage of materials that constitute a physical or health hazard in quantities in excess of those allowed in *control areas* complying with Section 414, based on the maximum allowable quantity limits for *control areas* set forth in Tables 307.1(1) and 307.1(2). Hazardous occupancies are classified in Groups H-1, H-2, H-3, H-4 and H-5 and shall be in accordance with this section, the requirements of Section 415 and the International Fire Code. Hazardous materials stored, or used on top of roofs or canopies, shall be classified as outdoor storage or use and shall comply with the International Fire Code.

307.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).

Combustible dusts 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 414.1.3.

Cryogenic fluids, flammable.

Flammable gases.

Organic peroxides, Class I.

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).

Pyrophoric liquids, solids and gases, nondetonable.

~~Storage of used or off specification lithium ion batteries in mixed use or detached buildings shall be in accordance with Section 315.8 of the International Fire Code.~~

Unstable (reactive) materials, Class 3, nondetonable.

Water-reactive materials, Class 3.

[F] 307.5 High-hazard Group H-3. Buildings and structures containing materials that readily support combustion or that pose a physical hazard shall be classified as Group H-3. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103.4 kPa) or less.

Combustible fibers, other than densely packed baled cotton, 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 414.1.3.

Consumer fireworks, 1.4G (Class C, Common)

Cryogenic fluids, oxidizing

Flammable solids

Organic peroxides, Class II and III

Oxidizers, Class 2

Oxidizers, Class 3, that are used or stored in normally closed containers or systems pressurized at 15 pounds per square inch gauge (103 kPa) or less

Oxidizing gases

Storage or recycling of used or off specification lithium batteries or cells in buildings as required by Section 315.8 of the International Fire Code.

Unstable (reactive) materials, Class 2

Water-reactive materials, Class 2

Commenter's Reason: The fire code committee disapproved F18-18 upon the submitters request.

The original proposal was submitted based upon language submitted during the NFPA 855 Energy Storage Systems standard draft work. Subsequent to submittal and posting, industry members were reached out to for review and comment. The industry identified that as proposed the language would prohibit, (shut down), many battery collection and recycling efforts currently in place including those required by law.

The battery industry formed their own code committee to work with the FCAC work group to come up with language that would provide the necessary level of protection that recognized existing industry initiatives. As result a number of floor modifications were developed, reviewed and supported by FCAC and requested to be considered by the IFC code hearing committee. Unfortunately the chair did not accept the floor modifications and as a result the proponent asked for disapproval to provide for a comprehensive public comment to be brought forth.

The first suggested modification is to add a definition for off specification batteries and cells to clarify that the intent is to apply the requirements to those batteries or cells that do not pass quality control testing during the manufacturing process and are stored for recycling or destruction.

Section 318.8 has been modified to clarify application of the requirements; include all types of batteries; use an easier to apply table format for application of the following sections; and to add two exceptions to application of the new requirements. The first exception recognizes a state of charge of 30% or less as an acceptable safety level. This level of

energy is recognized by the FAA for shipping of batteries and there is extensive data and testing information available. The second exception recognizes the use of laboratory testing to determine appropriate sprinkler density levels confirming fire event confinement, a concept already embraced for the installation of energy storage systems.

Section 318.1 has been modified to clarify that it applies to gathering activities. This is typically a box located in any occupancy where the public and/or employees deposit used batteries, including from home. They batteries are of mixed chemistry and typically in the smaller formats such as used for cameras, wireless phones, remotes, etc. The distance between collection containers has been modified to recognize that in some cases a clear space can be maintained, but that in others the space may have other combustible commodities located there such as in a retail establishment and in those cases the distance has been doubled since the intent is eliminate propagation from collection box to collection box.

Section 318.8.2 has been modified to recognize that there are a number of occupancies wherein larger format used batteries may be stored. The square footage limitation of 100 square feet has been enlarged to 200 square feet to recognize added space is necessary for storing large format batteries such as those for EVs. Three additional recognized methods of protected storage have been added with the same 200 square foot limitation to add options for facilities to apply. And a fifth option was added to simply go to the higher level protection found in Section 318.8.3 for H-3 indoor storage.

Section 318.8.3 has been modified to simply apply to indoor storage of amounts greater than that permitted by Sections 318.8.1 or 318.8.2. Whether or not it is a mixed use is covered by the IBC. The section was clarified to apply only to lithium batteries or cells and the group designation was changed to H-3 instead of H-2. (see later explanation below). The square foot limitation was eliminated based upon the high hazard group designation and the following protection levels that are required to be provided for. The remaining changes were format/editorial in nature.

Section 318.8.4 was deleted as no longer necessary due to the reformatting of Section 318.8.3. Those requirements now apply whether the indoor storage is in a dedicated building or a mixed use building.

Section 315.8.5 (now Section 318.8.4) was modified to only apply to lithium batteries and cells; eliminate the cubic foot limitation, simplify the exposure hazard listing and to modify the distance between piles to match distances already embraced by the IFC for hazardous materials.

The occupancy group designation proposal of H-2 in the IBC was changed to a H-3. The reason is twofold, first, H-2 is for materials that present a deflagration hazard in their natural state, not those that may produce combustible gases or vapors when burning. Something many products do. Secondly, many existing buildings and storage activities already exceed the H-2 area limitations, by applying H-3 instead there is still a high level of fire protection required with limitations in size by all but the Type 1A construction types. A facility can use Type 1A to obtain an unlimited area which is reasonable based upon the other protection features these new provisions will require.

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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

However, this will limit the facilities where used or off specification lithium-ion batteries can be stored.

Public Comment 2:

Proponent: Lynne M. Kilpatrick, Sunnyvale Department of Public Safety, representing California Fire Chiefs Association requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

105.6.27 Lithium batteries, used. An operational permit is required to collect or store more than 1,000 pounds (454 kg) of used lithium batteries.

315.8 Used lithium battery storage and handling. The storage and handling of used lithium ion and lithium metal

batteries or cells in quantities exceeding 1,000 pounds (454 kg) shall comply with Sections 315.8.1 through 315.8.10, and Chapter 32 where applicable.

315.8.1 Permits. Permits shall be required as set forth in Section 105.6.

315.8.2 Maximum quantity in a fire area. The aggregate quantity of used lithium batteries stored and handled in a single fire area shall not exceed 9,000 pounds (4086 kg).

315.8.3 Construction requirements. *Fire areas* shall be separated by *fire barriers* having a fire-resistance rating of not less than 2-hours 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*.

315.8.4 Number of fire areas. The maximum number of fire areas within a building shall be four.

315.8.5 Group H, Division 2 occupancy. Storage and handling of more than 9,000 pounds (4086 kg) of lithium batteries within a single fire area shall be within an approved Group H, Division 2 occupancy constructed in accordance with the *International Building Code* and protected throughout with approved automatic smoke detection and radiant-energy detection systems.

315.8.6 Automatic sprinkler system. Buildings containing *fire areas* used for lithium battery storage or handling shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. The design of the sprinkler system within each fire area shall not be less than Ordinary Hazard Group 2 with a design area of 3,000 square feet (278.7 m²). Where the storage arrangement is required by other provisions of this code to be provided with a higher level of sprinkler system protection, the higher level of sprinkler system protection shall be provided.

315.8.7 Automatic smoke detection. An approved automatic smoke detection system that activates an approved occupant notification system shall be provided throughout each *fire area* in accordance with Section 907.

315.8.8 Radiant energy detection. An approved radiant-energy detection system that activates an approved occupant notification system shall be installed throughout each *fire area* in accordance with Section 907.

315.8.9 Collection containers. Containers used to collect or store lithium batteries shall be noncombustible and have an individual capacity not exceeding 30 gallons (113.6 L), or be approved for transportation in accordance with the Department of Transportation (DOTn) regulations.

315.8.10 Storage configuration. Lithium batteries shall be considered a high-hazard commodity in accordance with Chapter 32 and where applicable, lithium battery storage shall comply with Chapter 32 in addition to Section 315.8.

2018 International Building Code

[F] 307.4 High-hazard Group H-2. Buildings and structures containing materials that pose a deflagration hazard or a hazard from accelerated burning shall be classified as Group H-2. Such materials shall include, but not be limited to, the following:

Class I, II or IIIA flammable or combustible liquids that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103.4 kPa).

Combustible dusts 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 414.1.3.

Cryogenic fluids, flammable.

Flammable gases.

Organic peroxides, Class I.

Oxidizers, Class 3, that are used or stored in normally open containers or systems, or in closed containers or systems pressurized at more than 15 pounds per square inch gauge (103 kPa).

Pyrophoric liquids, solids and gases, nondetonable.

Storage of used of lithium ion and lithium metal batteries or cells in accordance with Section 315.8 of the International Fire Code.

Unstable (reactive) materials, Class 3, nondetonable.

Water-reactive materials, Class 3.

Commenter's Reason: This proposal is a complete replacement of code proposal F18-18 as it is our position that the

original proposal's broad scope and intent to regulate every lithium ion and lithium metal battery collection location is unnecessary and not supported by fire loss data.

The technical provisions presented here are based on controls currently implemented at a major US company's lithium battery collection and recycling site. These controls, along with operational changes, were established after several fires at the site and have served to provide early warning and reasonable and adequate control of battery fires since their implementation.

A concept similar to the storage of hazardous materials within control areas is being introduced here by requiring used lithium battery storage and handling within designated fire areas protected by smoke detection, radiant-energy detection (e.g. UV/IR) and an Ordinary Hazard Group 2 automatic sprinkler system. In our opinion, the Ordinary Hazard Group 2 sprinkler design is justified until such time that additional large-scale testing takes place or data supporting a more rigorous means of fire protection is justified and accepted by the membership.

Section 315.8 allows up to 1,000 pounds (approximately 1/2 pallet) of lithium batteries before requiring additional controls. By setting the threshold quantity at 1,000 pounds, this section is intended to apply to locations where battery collection is a primary activity which is where additional fire and life safety controls are warranted. The 1,000-pound threshold is based on pre-2018 IFC regulations of energized lithium battery systems. Although that threshold was revised to 20 kWh in the 2018 IFC, the 1,000 pound-threshold, which is approximately equivalent to 20 kWh, is utilized for ease of enforcement.

Section 315.8.1 requires compliance with operational permits in accordance with Section 105.6 permit and a new permit (Section 105.6.27) is proposed to be added as a part of this public comment where used lithium battery storage or handling exceeds 1,000 pounds.

Section 315.8.2 establishes a maximum quantity of lithium batteries allowed within each designated fire area in the building. The maximum quantity proposed is 9,000 pounds, which is approximately 4 pallets. This 9,000-pound limit roughly correlates to the 600-kWh quantity that is currently allowed in Section 1206.2.9 for energized lithium battery systems before a Group H occupancy is required.

Section 315.8.3 requires that fire areas be separated from additional fire areas by fire barriers having not less than 2-hour fire resistance rating. The 2-hour fire resistance rating is proposed since it is the current protection required to separate a Group H2 occupancy from a B occupancy.

Section 315.8.4 limits the number of fire areas allowed in a building to four and is based on the control area approach to compartmentalizing hazardous materials in Chapter 50.

Section 315.8.5 mandates that where more than 9,000 pounds per fire area, or more than four fire areas are needed indoors, a Group H, Division 2 occupancy is required.

Sections 315.8.6-315.8.8 require that each fire area be protected by an approved smoke detection system, an approved radiant energy (e.g. UV/IR) detection system and an approved automatic sprinkler system having a minimum design standard of that required in Group H occupancies. The lithium battery fires we have experienced to date have tended to be very smoky fires and the smoke detection system coupled with the UV/IR flame detection system both serve as early warning systems to initiate the earliest possible response.

Section 315.8.9 requires containers to be either DOT approved for transportation of batteries or noncombustible with an individual capacity limited to 30 gallons.

Section 315.8.10 mandates that lithium batteries be treated as a high hazard commodity and where such storage is over 6 feet on racks must also comply with Chapter 32 provisions for high-piled combustible storage.

IBC Section 307.4 simply provides the appropriate link to the IFC and acknowledges that the IBC is where occupancy classifications are established.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This proposal will increase the cost of construction only where lithium battery quantities exceed 1,000 pounds.

Public Comment 3:

Proponent: Kevin Callahan, CompTIA, representing Director, Computing Technology Industry Association requests Disapprove.

Commenter's Reason: On behalf of the Computing Technology Industry Association (CompTIA), we respectfully submit these comments in opposition to Code Proposal F18-18. CompTIA is a non-profit trade association serving as the voice of the information technology industry. With approximately 2,000 member companies, 3,000 academic and training partners

and nearly 2 million IT certifications issued, CompTIA is dedicated to advancing industry growth through educational programs, market research, networking events, professional certifications and public policy advocacy.

Last month, CompTIA submitted a letter to the Fire Code Action Committee (FCAC) with our initial comments on the proposed code amendments. The letter, which is attached for your reference, highlights our concerns regarding the overly restrictive regulations that are neither practical nor substantiated by data. Equally troubling is the lack of meaningful dialogue with relevant stakeholders that has taken place during the course of the preparation and review of this proposal. For these reasons and others cited in the letter, CompTIA requested the FCAC to deny or postpone action on the code amendments.

In June, the FCAC approved F18-18 without addressing the concerns raised in our earlier letter. As such, we continue to have the same misgivings regarding the proposed code amendments. We ask the ICC to deny or postpone Code Proposal F18-18, and instead allow for a more open and transparent process to create practical, meaningful regulations for the safe storage of used batteries.

Thank you for your consideration of our comments.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

However this will limit the facilities where used or off specification lithium-ion batteries can be stored, increasing costs to businesses of all sizes.

F18-18

F21-18

IFC: SECTION 320, 320.1

Proposed Change as Submitted

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

2018 International Fire Code

Add new text as follows

SECTION 320 ARTIFICIAL DECORATIVE VEGETATION

320.1 General. Artificial decorative vegetation placed outdoors, either within 30 feet (9140 mm) of a building, or on an occupied roof of a building, shall comply with Sections 807.4.1 and 807.4.2

Reason: There is abundant evidence that combustible materials outdoors can cause severe fires that can spread to a nearby building. One example is artificial decorative vegetation. The recent fire at the Cosmopolitan Hotel in Las Vegas (which involved unregulated decorative vegetation) has demonstrated that combustible materials in occupiable roofs can also cause significant fire damage. The distance of 30 feet was chosen because it is considered the distance beyond which accessory structures in wildland areas cease being a serious fire safety concern. The fire testing recommended (807.4.1) is the same as for indoor artificial vegetation, namely either NFPA 701 (test methods 1 or 2, as appropriate, based on the type of material) or NFPA 289, with a 20 kW ignition source. The additional requirement (807.4.2) is that no unlisted electrical wiring or lighting is permitted on the decorative vegetation item.

Cost Impact: The code change proposal will increase the cost of construction. Artificial decorative vegetation used outdoors near a building or on a roof will have to be fire tested.

F21-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the requirement would be difficult to enforce and does not include other elements. (Vote: 13-1)

Assembly Action:

None

F21-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

SECTION 320 ARTIFICIAL ~~DECORATIVE-COMBUSTIBLE~~ VEGETATION ON ROOFS AND NEAR BUILDINGS

320.1 General. Artificial ~~decorative vegetation placed~~ combustible vegetation exceeding 6 feet (1830 mm) in height installed outdoors, either within 30-3 feet (9140-914 mm) of a building, or on an occupied the roof of a building, shall comply with Sections be labeled as having complied with Section 807.4.1. The placement of the vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Where there is no opening within 5 feet (1524 mm) of the combustible vegetation.

Commenter's Reason: This public comment addresses several issues raised during the committee action hearing, as follows.

1. A much lower distance is used (3 feet), which ensures that this will not apply to distant vegetation.
2. A size limitation has been placed on the vegetation (more than 6 feet), which ensures that it will not apply to small items.
3. It is made clear that this applies to installations, and not to items on castors or items brought to the site for a specific event. Note that installations of over 6 feet in height will be something that has a considerable source of fire.
4. The concept of occupied roof has been deleted, so it applies to all roofs because the potential for damage is the same whether or not people are present.
5. A requirement for placing a label on the vegetation will make it easier to enforce. The label refers only to the fire test contained in chapter 8 and the requirement for the label will make it easier for enforcers.
6. Requirements to meet the same other issues as vegetation placed indoors has been added as a separate sentence, without information being required on the label.
7. An exception has been added to ensure that it does not apply if there are no nearby openings.

The type of construction is not being proposed as an exception because the danger is associated with the penetration via openings (which can exist for all types of construction) or with fire exposure by people and other combustibles in the proximity of the vegetation.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Very large combustible artificial vegetation will have to be fire tested when placed close to a building.

F21-18

F22-18

IFC: 105.6.1 (New), 202(New), 301.2, 302.1, 320 (New), Chapter 80

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Add new text as follows

105.6.1 Additive Manufacturing. An operational permit is required to conduct additive manufacturing operations as covered in Section 320.3.

3D PRINTER. A machine used in the additive manufacturing process for fabricating objects through the deposition of a material using a print head, nozzle, or another printer technology.

ADDITIVE MANUFACTURING. A process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. The Code recognizes two types of additive manufacturing:

Revise as follows

301.2 Permits. Permits shall be required as set forth in Section 105.6 for the activities or uses regulated by Sections 306, 307, 308, ~~315~~ and ~~315~~320.

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

3D PRINTER.

ADDITIVE MANUFACTURING.

BONFIRE.

HI-BOY.

HIGH-VOLTAGE TRANSMISSION LINE.

OPEN BURNING.

PORTABLE OUTDOOR FIREPLACE.

POWERED INDUSTRIAL TRUCK.

RECREATIONAL FIRE.

SKY LANTERN.

Add new text as follows

SECTION 320 ADDITIVE MANUFACTURING (3D PRINTING)

320.1 General. Additive manufacturing equipment and operations shall comply with Section 320.

320.1.1 Scope. Additive manufacturing shall comply with one of the following:

1. Non-industrial additive manufacturing shall comply with Section 320.2.
2. Industrial additive manufacturing shall comply with Section 320.3.

320.2 Non-industrial additive manufacturing. Non-industrial additive manufacturing equipment and operations shall

comply with Section 320.2.1 through 320.2.5.

320.2.1 Industrial manufacturing. Non-industrial additive manufacturing equipment and operations shall comply with Section 320.2. Additive manufacturing equipment and operations that do not comply with 320.2.1 through 320.2.5 shall comply with Section 320.3.

320.2.2 Listing. 3D printers used in non-industrial additive manufacturing shall be listed and labeled in accordance with UL 60950-1 or UL 62368-1. The listing shall also verify:

1. The 3D printers are self-contained and do not utilize ancillary equipment, other than pre-packaged production materials.
2. The operation of the 3D printers will not create a hazardous (classified) environment outside of the unit's outer enclosure as defined in NFPA 70, Article 500.
3. The 3D printers are only intended for use with maximum 30 liter prepackaged production materials, which are investigated with the 3D printer and identified in the manufacturer's instruction.

320.2.3 Installation, operation and maintenance. 3D printers shall be installed, operated and maintained in accordance with this Code, the listing and the manufacturer's instructions.

320.2.4 Installation limitations. Non-industrial additive manufacturing shall be limited to installations and operations that comply with all of the following:

1. Do not utilize external dust collection systems.
2. Do not utilize external inert gas supplies for creating an inert environment.
3. Do not utilize automated external powder feed or sieve features.
4. Do not utilize hazardous materials in excess of the maximum allowable quantities regulated by Chapter 50.

320.2.5 Occupancies. Non-industrial additive manufacturing shall be permitted in all occupancy groups.

320.3 Industrial additive manufacturing. Industrial additive manufacturing equipment and operations shall comply with Section 320.3.1 through 320.3.9.

320.3.1 Additive manufacturing operations and equipment. Additive manufacturing operations and equipment that do not comply with Section 320.2 shall comply with Section 320.3.

320.3.2 Permits required. Permits shall be obtained from the fire code official in accordance with Section 105.6 prior to engaging in industrial additive manufacturing operations.

320.3.3 Listing. 3D printers used in industrial additive manufacturing shall be listed and labeled in accordance with UL 2011 or approved for the application based on a field evaluation conducted by an approved agency.

320.3.4 Installation, operation and maintenance. Industrial additive manufacturing equipment shall be installed, operated and maintained in accordance with this code, the manufacturer's instructions and where applicable the listing.

320.3.5 Combustible dusts and metals. Industrial additive manufacturing operations that use or generate combustible dust or combustible metals shall comply with Chapter 22, Chapter 50 and this section.

320.3.5.1 Powder evaluation. Printing powders used in industrial additive manufacturing operations shall be tested for combustibility in accordance with NFPA 484 or 654 as applicable. A copy of test reports shall be provided to the fire code official upon request.

320.3.5.2 Combustible (non-metallic) dusts. Industrial additive manufacturing that uses combustible (non-metallic) dusts shall comply with NFPA 654.

320.3.5.3 Combustible metals. Industrial additive manufacturing operations that use combustible metals shall also comply with NFPA 484.

320.3.5.4 Ancillary equipment. Ancillary equipment provided for recycling, sieving, vacuuming or handling combustible powders shall be designed and approved for such use.

320.3.6 Hazardous materials. Industrial additive manufacturing operations that use hazardous materials exceeding the maximum allowable quantities shall comply with Chapter 50.

320.3.7 Technical assistance. Where required by the fire code official, a report evaluating the acceptability of technologies, processes, products, facilities, materials and uses associated with the operation shall be provided in accordance with 104.7.2 and approved.

320.3.8 Performance based design alternative. Where approved by the fire code official, buildings and facilities where industrial additive manufacturing is performed shall be permitted to comply with the performance based design options in Section 5001.3 as an alternative to compliance with the other requirements set forth in this Section.

320.2.9 Occupancies. Industrial additive manufacturing shall only be conducted in the occupancy groups associated with manufacturing operation, and permitted by the Chapter 50 maximum allowable quantity tables. Where approved, the requirements in Section 320.3.6 shall be permitted to provide the technical basis for determining compliance with Table 5003.1.1(1), footnote q.

Add new standard(s) follows

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

2011-06:

Factory Automation Equipment
60950-1—14:

Information Technology Equipment - Safety Requirements
62368-1—14:

Audio/video, Information and Communication Technology Equipment - Safety Requirements

Reason: The use of additive manufacturing, often referred to as 3D printing, is becoming more prevalent in industrial and non-industrial applications. This proposal introduces basic safety requirements for these operations.

Non-industrial additive manufacturing - 3D printers are available for less than \$500

and are being used in classrooms, offices and businesses for producing customized

products and prototypes. Section 320.2 establishes basic safety requirements for

this self-contained equipment, which includes pre-packaged production materials. The product listing is being relied upon to verify that the equipment operates safely and does not create a hazardous (classified) area outside of the unit.

Industrial use additive manufacturing - Section 320.3 covers 3D additive manufacturing operations, which includes all operations that aren't covered by Section 320.2. These are typically industrial operations using external powder feed supplies, dust collection systems and/or inert gas supplies. Some of the requirements for industrial operations are as follows:

320.3.3 requires the industrial 3D printer to be listed to UL 2011, but includes an option for non-listed equipment to be approved based on a field evaluation.

320.3.6 was added due to the new unique challenges some jurisdictions may face in approving industrial additive manufacturing operations. Among other resources they can use is a risk assessment conducted in accordance with the UL 3400 Outline of Investigation for Additive Manufacturing Facility Safety Management, which is applicable where parts are manufactured using powder-based additive manufacturing techniques.

This section also includes a pointer to the Section 5001.3 performance based design option, which has been used in some industrial additive manufacturing operations.

An operational permit is required for industrial additive operations.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

There is no significant cost increase for non-industrial additive manufacturing covered by Section 320.2, unless the price of listed equipment is higher than non-listed equipment. There are increased costs for industrial additive manufacturing operations that might be related to obtaining listed equipment, and the operational permit fees.

Analysis: A review of the standard proposed for inclusion in the code, UL 2011-06, UL 60950-1-14, and UL 62368-1—14, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F22-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. (Vote: 8-5)

Assembly Action:

None

F22-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

ADDITIVE MANUFACTURING. A process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. The Code recognizes two types of additive manufacturing:

Industrial additive manufacturing. 3D printing that uses equipment external to the 3D printer for feed of powders or dust collection operations that typically utilize combustible powders or metals, an inert gas supply, a combustible dust collection system, or that create a hazardous (classified) location area or zone outside of the equipment.

Non-industrial additive manufacturing. 3D printing which exclusively uses self-contained 3D printing equipment without external powder supply, dust collection system, or inert gas supply operations that do create a hazardous (classified) location area outside of the equipment, and do not utilize an inert gas supply or a combustible dust collection system.

320.1.2-3 Installation, operation and maintenance. 3D printers and associated additive manufacturing equipment shall be installed, operated and maintained in accordance with this Code, the listing and the manufacturer's instructions.

320.1.3 Production materials. Only the production materials listed for use with the equipment and included in the manufacturer's instructions shall be used.

320.2 Non-industrial additive manufacturing. Non-industrial additive manufacturing equipment and operations shall comply with Section 320.2.1 through 320.2.5. Additive manufacturing equipment and operations that do not comply with Section 320.2 shall comply with Section 320.3.

320.2.1 Industrial manufacturing. ~~Non-industrial additive manufacturing equipment and operations shall comply with Section 320.2. Additive manufacturing equipment and operations that do not comply with 320.2.1 through 320.2.5 shall comply with Section 320.3.~~

320.2.21 Listing. 3D printers used in non-industrial additive manufacturing shall be listed and labeled in accordance with UL 60950-1 ~~or~~ UL 62368-1 or UL 2011. The listing shall also verify:

1. The 3D printers are self-contained and ~~do not utilize ancillary equipment, other than~~ utilize maximum 30 liter pre-packaged production materials.
2. The operation of the 3D printers ~~will~~ shall not create a hazardous (classified) ~~environment electrical area or zone~~ outside of the unit's.
3. If any hazardous (classified) electrical area or zone exists inside of the unit's outer enclosure as defined in NFPA 70, Article 500.3, the area shall be protected by intrinsically safe electrical construction or other acceptable protection methods.
4. The 3D printers shall not utilize inert gas or an external combustible dust collection system. ~~The 3D printers are only intended for use with maximum 30 liter prepackaged production materials, which are investigated with the 3D printer and identified in the manufacturer's instruction.~~

320.2.4 Installation limitations. ~~Non-industrial additive manufacturing shall be limited to installations and operations that comply with all of the following:~~

1. ~~Do not utilize external dust collection systems.~~

2. Do not utilize external inert gas supplies for creating an inert environment.
3. Do not utilize automated external powder feed or sieve features.
4. Do not utilize hazardous materials in excess of the maximum allowable quantities regulated by Chapter 50.

320.2.52 Occupancies. Non-industrial additive manufacturing shall be permitted in all occupancy groups.

320.3 Industrial additive manufacturing. Industrial additive manufacturing equipment and operations shall comply with Section 320.3.1 through 320.3.912.

~~**320.3.1 Additive manufacturing operations and equipment.** Additive manufacturing operations and equipment that do not comply with Section 320.2 shall comply with Section 320.3.~~

320.3.21 Permits required. Permits shall be obtained from the fire code official in accordance with Section 105.6 prior to engaging in industrial additive manufacturing operations.

320.3.32 Listing. 3D printers used in industrial additive manufacturing shall be listed and labeled in accordance with UL 2011 or approved for the application based on a field evaluation conducted by an approved agency.

~~**320.3.4 Installation, operation and maintenance.** Industrial additive manufacturing equipment shall be installed, operated and maintained in accordance with this code, the manufacturer's instructions and where applicable the listing.~~

320.3.53 Combustible dusts and metals. Industrial additive manufacturing operations that use or generate store, use or produce combustible dust or combustible metals shall, combustible particulate solids or combustible metals shall comply with Chapter 22, ~~Chapter 50~~ and this section.

~~**320.3.5.14 Powder evaluation.** Printing powders used in industrial additive manufacturing operations shall be tested for combustibility in accordance with NFPA 484 or 654-NFPA 652 as applicable. A copy of test reports shall be provided to the fire code official upon request.~~

320.3.5.2 Combustible (non-metallic) dusts. Industrial additive manufacturing ~~that uses~~ operations that store, use or produce combustible (non-metallic) dusts shall comply with NFPA 654.

320.3.5.36 Combustible metals. Industrial additive manufacturing operations that store or use combustible metals shall ~~also~~ comply with NFPA 484.

320.3.5.47 Ancillary equipment. Ancillary equipment provided for recycling, sieving, vacuuming or handling combustible powders shall be designed and approved for such use.

320.3.68 Hazardous materials. Industrial additive manufacturing operations that store or use hazardous materials exceeding the maximum allowable ~~quantities~~ quantity limits shall comply with Chapter 50.

320.3.9 Inert Gas. Additive manufacturing processes that utilize inert gases shall comply with Chapter 53. Ventilation or gas detection shall be provided in accordance with Section 5307.

320.3.710 Technical assistance. Where required by the fire code official, a report evaluating the acceptability of technologies, processes, products, facilities, materials and uses associated with the operation shall be provided in accordance with 104.7.2 and approved.

~~**320.3.811 Performance based design alternative.** Where approved by the fire code official, buildings and facilities where industrial additive manufacturing is performed shall be permitted to comply with the performance based design options in Section 5001.3 as an alternative to compliance with the other requirements set forth in this Section.~~

~~**320.23.912 Occupancies.** Industrial additive manufacturing shall only be conducted in the occupancy groups associated with manufacturing operation, and permitted by the Chapter 50 maximum allowable quantity tables. Where approved, the requirements in Section 320.3.6 shall be permitted to provide the technical basis for determining compliance with Table 5003.1.1(1), footnote q.~~

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The IFC committee supported the inclusion of additive manufacturing (AM) requirements in the code, but had concerns with some of the proposed language, which has been addressed with this public comment. Highlights of the changes include:

The definitions of non-industrial and industrial additive manufacturing were revised to clarify the type of operations covered by each of them.

Common requirements for "Installation, operation and maintenance" and "Production materials" were move to Section 320.1 from Sections 320.2 and 320.3.

Non-industrial additive manufacturing requirements were revised to clarify they do not include equipment that has the potential to produce a hazardous (classified) location electrical area or zone outside the 3D printer enclosure, which could lead to a potential combustible dust or vapor explosion. The typical cord connected desktop 3D printers used in personal and professional (non-industrial) applications today are not covered by operational permits and are intended for use in ordinary electrical locations.

Industrial additive manufacturing requirements were revised to improve readability, correct references, and address the safety of inert gas used in the production process.

Unnecessary cross references and duplicative requirements were removed.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. Potential cost increases since these operations were previously not regulated in the IFC.

F22-18

F23-18

IFC: SECTION 320, 320.1, 320.2, 320.3, 320.4, 320.5, 320.6

Proposed Change as Submitted

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

2018 International Fire Code

Add new text as follows

SECTION 320 OUTDOOR FURNITURE AFFIXED OUTSIDE BUILDINGS

320.1 General. Outdoor furniture, such as benches, that are affixed outside buildings, shall be considered storage and shall comply with section 315 and this section.

Exception: Outdoor furniture placed beneath overhead projections from buildings where automatic sprinklers are installed under such projections in accordance with Section 315.4.1.

320.2 Distance from buildings. Furniture placed outdoors shall not be affixed within 5 feet (1524 mm) of any building, except if it is labeled as having complied with any one of Sections 320.3 through 320.6.

320.3 Traditional materials. The furniture shall be constructed entirely of wood, identified for outdoor use, and non-combustible materials, complying with Section 703.5.1 of the International Building Code.

320.4 Plastic composites. The furniture shall be constructed entirely of materials that meet all the requirements for plastic composite deck boards, in accordance with section 2612 of the International Building Code.

320.5 Heat release. The furniture shall be constructed entirely of materials intended for outdoor use that exhibit a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation.

320.6 Full scale testing. The furniture shall be constructed entirely of materials intended for outdoor use and the entire item of furniture shall exhibit a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289, using the 20 kW ignition source.

Reason: Section 315 of the IFC addresses storage, including, particularly, storage beneath overhead projections from buildings (Section 315.4.1). However, storage is defined as something intended for future use. The IFC code does not make it clear whether items placed permanently (for example by being secured or screwed in place) near a building (or against a building) for their immediate use are necessarily considered to be "stored" and whether the storage section applies.

It has been found that when plastic benches are attached to buildings and placed underneath overhead projections, they can result in severe fires that can destroy the overhang and then continue to destroy the building itself. ATF conducted tests on several plastic lumber benches simulating an actual incident. In the incident, a plastic lumber bench attached to a brick wall, from the outside, at a school and under an overhang, was ignited with a small ignition source (child's coat) and the entire school was destroyed soon after ignition. Tests conducted by GBH International showed that a Southern Yellow Pine (standard park bench lumber) would have performed much better and that even some plastic lumber materials could have done much better. The maximum heat release rate of plastic lumber bench ignited in this type of scenario is very high and can be above 4 MW, while the wood bench did not ignite the overhang. An attached set of pictures and information shows key results.

It is interesting that the IFC does an excellent job in regulating garbage cans and laundry carts placed near buildings (even if they are not secured in place) but it does not regulate park benches, or other park furniture.

It has been explained that the practice of placing park benches under an overhang is a common feature in areas where rain is frequent, for protection.

The code proposal would allow benches, or other outdoor furniture, constructed of wood or of non-combustible materials without further requirements (traditional materials).

If plastic benches (or plastic composite benches) are proposed to be placed near buildings, the proposal states that they need to comply with one of the following: (a) the same requirements as plastic composites used for deck boards (i.e. section 2612 of the IBC), (b) the same heat release results from ASTM E1354 that materials used for garbage cans or

laundry carts are required to meet (i.e. section 304.3 or 318.1) or the same heat release results as decorative materials (i.e. section 807.3) or foam plastic exhibit booths (i.e. section 807.5.1) are required to meet.

At the same time the code proposal clarifies that combustible products placed for immediate use outside buildings must comply with the same storage requirements as those stored for future use, in section 315. This means that if the furniture is placed beneath overhead projections, automatic sprinklers must be installed under such projections, per 315.4.1, as shown below.

315.4.1 Storage beneath overhead projections from buildings. Where buildings are protected by an automatic sprinkler system, the outdoor storage, display and handling of combustible materials 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.

Cost Impact: The code change proposal will increase the cost of construction. This code proposal will require that outdoor furniture affixed near a building must have improved fire performance, which will improve fire safety.

F23-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the requirements should not be conditional on if the furniture is affixed due to inconsistency. In addition there is no criteria provided for the distance of 5 feet, the type of exterior wall is not addressed and the heat release requirement does not take into account the type of furniture material. (Vote: 14-0)

Assembly Action:

None

F23-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marcelo Hirschler, representing GBH International (mmh@gbhint.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

SECTION 320 ~~OUTDOOR FURNITURE AFFIXED OUTSIDE BUILDINGS~~

320.1 General. ~~Outdoor furniture, such as benches, that are affixed outside buildings, shall be considered storage and shall comply with section 315 and this section.~~

Exception: ~~Outdoor furniture placed beneath overhead projections from buildings where automatic sprinklers are installed under such projections in accordance with Section 315.4.1.~~

320.1 General Furniture, such as benches, placed outside buildings under a combustible exterior projection shall comply with Section 320.2 and any one of Sections 320.3, 320.4, 320.5 or 320.6.

Exception: Where automatic sprinklers in accordance with Section 315.4.1 are installed under the exterior projection.

320.2 Distance from buildings. ~~Furniture placed outdoors shall not be affixed placed outdoors within 5-2 feet (1524 mm610 mm) of any building, except if unless it is labeled as having complied with any one of Sections 320.3 through 320.6.~~

320.3 Traditional materials. ~~The furniture shall be constructed entirely of wood, identified for outdoor use, and non-combustible noncombustible materials, complying with Section with Section 703.5.1 of the International Building Code, or of wood.~~

320.4 Plastic ~~composites~~ composite materials. The furniture shall be constructed entirely of plastic composite materials that meet all the requirements for plastic composite deck boards, in accordance with section 2612 of the International Building Code.

320.5 Heat release. ~~The As an alternate to the requirements in Sections 320.3, 320.4 and 320.6, the furniture shall be permitted to be constructed entirely of materials intended for outdoor use that exhibit a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation.~~

320.6 Full scale testing. ~~The furniture shall As an alternate to the requirements in Sections 320.3, 320.4 and 320.5, the furniture shall be permitted to be constructed entirely of materials intended for outdoor use and such that the entire item of furniture shall exhibit exhibits a maximum rate of heat release not exceeding 100 kW when tested in accordance with NFPA 289, using the 20 kW ignition source.~~

Commenter's Reason: The public comment addresses all comments received during the hearings and the committee concerns, as follows.

1. The requirement that the furniture be affixed was eliminated.

2. The requirement is restricted to furniture within 2 feet of a building and under a combustible exterior projection.
3. The type of construction has not been amended because the incident inspiring this code proposal occurred with benches placed against a brick wall and yet the entire building was destroyed, starting with burning the combustible exterior projection. (see attached image)
4. All references to storage have been eliminated.
5. The section on traditional materials was revised to clarify that only noncombustible materials need to comply with the noncombustibility test in 703.5.1.
6. The section on plastic composite materials was revised to clarify that it applies only to plastic composite materials.
7. The sections on heat release testing (320.5 and 320.6) were revised to clarify that they alternate options to the requirements in sections 320.3 and 320.4, which apply, respectively, to wood (and noncombustible materials) and to plastic composite materials.
8. The exception for areas protected by sprinklers is retained.
9. The requirement that the materials be intended for outdoor use is being deleted because it would be difficult to enforce and it is not a safety issue.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This code proposal will require that outdoor furniture placed near a building must have improved fire performance, which will improve fire safety.

F23-18

F26-18

IFC: 403.3.2, 403.8.1.1.2, 403.8.2.2, 403.8.3.1, 403.10.3.1.1

Proposed Change as Submitted

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

403.3.2 Fire safety plan. A copy of the fire safety plan shall be maintained at the facility at all times. The plan shall include all of the following in addition to the requirements of Section 404:

1. Locations of ~~patients-care recipients~~ who are rendered incapable of self-preservation.
2. Maximum number of ~~patients-care recipients~~ rendered incapable of self-preservation.
3. Area and extent of each ambulatory care facility.
4. ~~Location of adjacent smoke compartments or refuge areas, where required.~~
5. ~~Path of travel to adjacent smoke compartments.~~
6. Location of any special locking, ~~delayed egress or access control~~ arrangements.

403.8.1.1.2 Fire safety plans-plan. A copy of the fire safety plan shall be maintained at the facility at all times. ~~Plans~~ The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of ~~resident-care recipient~~ sleeping rooms.
2. Location of special locking or egress control arrangements.

403.8.2.2 Fire safety plans-plan. A copy of the plan shall be maintained at the facility at all times. ~~Plans~~ The plan shall include all of the following in addition to the requirements of Section 404.2.2:

1. Location and number of ~~patient-care recipients~~ sleeping rooms and operating rooms.
2. ~~Location of adjacent smoke compartments or refuge areas.~~
3. ~~Path of travel to adjacent smoke compartments.~~
4. Location of special locking, ~~delayed egress or access control~~ arrangements.
5. ~~Location of elevators utilized for patient movement in accordance with the fire safety plan, where provided.~~

Add new text as follows

403.8.3.1 Fire safety plan. A copy of the fire safety plan shall be maintained at the facility at all times. The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of cells.
2. Location of special locking arrangements.

Revise as follows

403.10.3.1.1 Fire safety plans. A copy of the fire safety plan shall be maintained at the facility at all times. ~~Plans~~ The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of ~~resident-care recipient~~ sleeping rooms.
2. Location of special locking ~~or egress control~~ arrangements.

Reason: This is a series of proposal to coordinate the fire safety, evacuation and lock down plans between Groups I-1, I-2, I-3, R-4 and ambulatory care facilities. The FCAC and Healthcare committees worked together to address all situations where a staged evacuation or defend-in-place is utilized. See the proposal to IFC Section 403.3 for information on what these changes will look like if all pass.

Group I-1, Condition 2 includes smoke compartments. When looking at adding smoke compartments, refuge area and path of travel, it was noted that this is already stated in 404.2.1 Item 1 and 404.2.2 Items 2.2 and 4.5. Therefore it is proposed to remove from Ambulatory care and Group I-2. Assisted evacuation is addressed in 404.2.1 Item 4 and 404.2.2 Item 2.3.

All patients and residents have been changed to care recipients to be consistent with the definitions for these types of facilities.

Last cycle there was a lot of work on the different locking systems. There should be a consistent and generic reference for these locking systems - "location of special locking arrangements". This will eliminate a laundry list and improve coordination over time as locking arrangements for ingress and egress are added.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Committee on Healthcare (CHC).

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to 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 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes.* Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. These are operational requirements for emergency responders, resident and staff safety and therefore will not affect the cost of construction.

F26-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 403.8.2.2 Fire safety plan. A copy of the plan shall be maintained at the facility at all times. The plan shall include all of the following in addition to the requirements of Section 404.2.2:

1. Location and number of care recipients sleeping rooms and operating rooms.
2. Location of special locking ~~control~~ arrangements.

Committee Reason: This proposal addresses the correct terminology "care recipient" versus "patient." In addition this proposal removes duplicative language that is already provided in Section 404 for smoke compartments. Section 403.8.2.2 was modified to remove "control" from item 4 to be consistent with the revisions in sections 403.3.2 and 403.10.3.1.1. (Vote: 14-0)

Assembly Action:

None

F26-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

403.8.1.1.2 Fire safety plan. A copy of the fire safety plan shall be maintained at the facility at all times. The plan shall include the following in addition to the requirements of Section 404.2.2:

1. Location and number of care recipient sleeping rooms.
2. Location of special locking ~~or egress control~~ arrangements.

Commenter's Reason: This additional modification is for consistency with the modification to the proposal and the original proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The modification is for terminology and will not change any building construction requirements.

F26-18

F28-18

IFC: 403.3.4, 403.8.1.6, 403.8.2.3, 403.10.3.6, 405.1, 405.2

Proposed Change as Submitted

Proponent: John Williams, Chair, representing Healthcare Committee (AHC@iccsafe.org); Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Delete without substitution

~~**403.3.4 Emergency evacuation drills.** Emergency evacuation drills shall comply with Section 405.~~

~~**Exception:** The movement of patients to safe areas or to the exterior of the building is not required.~~

~~**403.8.1.6 Resident participation in drills.** Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.~~

Revise as follows

403.8.2.3 Emergency evacuation drills. Emergency evacuation drills shall comply with Section 405.

~~**Exceptions**~~ **Exception:**

- ~~1. The movement of patients to safe areas or to the exterior of the building is not required.~~
- ~~2. Where emergency evacuation drills are conducted after visiting hours or where patients or residents are expected to be asleep, a coded announcement shall be an acceptable alternative to audible alarms.~~

Delete without substitution

~~**403.10.3.6 Resident participation in drills.** Emergency evacuation drills shall involve the actual evacuation of residents to a selected assembly point and shall provide residents with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.~~

~~**Exception:** Actual exiting from emergency escape and rescue windows shall not be required. Opening the emergency escape and rescue window and signaling for help shall be an acceptable alternative.~~

Revise as follows

405.1 General. Emergency fire and evacuation drills complying with Sections 405.2 through 405.9 shall be conducted not less than annually where fire safety and evacuation plans are required by Section 403 or where required by the *fire code official*. Drills shall be designed in cooperation with the local authorities.

Add new text as follows

405.2 Occupant participation. Emergency fire and evacuation drills shall involve the actual evacuation of occupants to a selected assembly point and shall provide occupants with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.

Exceptions:

1. In Ambulatory Care Facilities and Group I-2 the movement of care recipients to a safe area or to the exterior of the building is not required.
2. In Group I-1, Condition 2 the assembly point for residents is permitted to be within an adjacent smoke compartment.
3. In Group R-4, actual exiting from emergency escape and rescue openings shall not be required. Opening the emergency escape and rescue opening and signaling for help shall be an acceptable alternative.
4. In Group I-3, Conditions 2 through 5 where a defend-in-place response is permitted, the assembly point for detainees is permitted to be within an adjacent smoke compartment.
5. In Group I-3, Conditions 2 through 5, movement of detainees is not required to an assembly point is not required where there are security concerns.

Reason: This is a series of proposal to coordinate the fire safety, evacuation and lock down plans between Groups I-1, I-2, I-3, R-4 and ambulatory care facilities. The FCAC and Healthcare committees worked together to address all situations where a staged evacuation or defend-in-place is utilized. See the proposal to IFC Section 403.3 for information on what these changes will look like if all pass.

The requirements for drills in Section 405 never really say where you move to during a drill. It is only implied in IFC 405.8 when it mentions accountability at assembly points.

How to leave and get to an assembly point is stated for Group I-1 and R-4, but does not recognize the new requirements for smoke compartments in Group I-1, Condition 2. It is implied by the exceptions in ambulatory care and Group I-2 that drills are for moving to smoke compartments by having exception for movement of patients in beds. This should be stated at the beginning of the drill requirements for all facilities.

The exceptions for drills should be in the drill section specifically. The exceptions could stay in the specific requirements, but only if Section 405 included a description of what was supposed to happen for drills, otherwise the reference to Section 405 does not make sense.

Exception 4 and 5 are in recognition of detainee participation in drills for jails.

Note: If both exceptions to 403.8.2.3 are removed (exception 1 is addressed under a different proposal), the whole section is redundant text and should be removed.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Committee on Healthcare (CHC).

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 2017 the Fire-CAC has held 3 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to 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 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes.* Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. These are operational requirements for emergency responders, resident and staff safety and will not affect the cost of construction.

F28-18

Public Hearing Results

Errata:

405.2 Occupant participation. Emergency fire and evacuation drills shall involve the actual evacuation of occupants to a selected assembly point and shall provide occupants with experience in exiting through all required exits. All required exits shall be used during emergency evacuation drills.

Exceptions:

1. In Ambulatory Care Facilities and Group I-2 the movement of care recipients to a safe area or to the exterior of the building is not required.
2. In Group I-1, Condition 2 the assembly point for residents is permitted to be within an adjacent smoke compartment.
3. In Group R-4, actual exiting from emergency escape and rescue openings shall not be required. Opening the emergency escape and rescue opening and signaling for help shall be an acceptable alternative.
4. In Group I-3, Conditions 2 through 5 where a defend-in-place response is permitted, the assembly point for detainees is permitted to be within an adjacent smoke compartment.
5. In Group I-3, Conditions 2 through 5, movement of detainees is not required to an assembly point ~~is not required~~ where there are security concerns.

Committee Action:

Disapproved

Committee Reason: This was disapproved as it was felt that Section 405.2 as proposed would apply too broadly to all occupancies and requires all available exits to be used during drills which is seen as excessive. In addition, the term "patient" needs to be revised to "care recipients." (Vote: 14-0)

Assembly Action:

None

F28-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

403.8.2.3 Emergency evacuation drills. Emergency evacuation drills shall comply with Section 405.

Exception: Where emergency evacuation drills are conducted after visiting hours or where ~~patients or residents~~ care recipients are expected to be asleep, a coded announcement shall be an acceptable alternative to audible alarms.

405.2 Occupant participation. Emergency fire and evacuation drills shall involve the actual evacuation of occupants to a selected assembly point and shall provide occupants with experience in exiting through ~~all~~ required exits. ~~All required exits shall be used during emergency evacuation drills.~~

Exceptions:

1. In Ambulatory Care Facilities and Group I-2 the movement of care recipients to a safe area or to the exterior of the building is not required.
2. In Group I-1, Condition 2 the assembly point for residents is permitted to be within an adjacent smoke compartment.
3. In Group R-4, actual exiting from emergency escape and rescue openings shall not be required. Opening the emergency escape and rescue opening and signaling for help shall be an acceptable alternative.
4. In Group I-3, Conditions 2 through 5 where a defend-in-place response is permitted, the assembly point for detainees is permitted to be within an adjacent smoke compartment.
5. In Group I-3, Conditions 2 through 5, movement of detainees is not required to an assembly point is not required where there are security concerns.

Commenter's Reason: The proposed deletion to Section 405.2 was a recommendation by the Fire Code Development Committee. This was originally copied from 2018 IFC Section 403.8.1.6 and 403.10.3.6. However, which exits are used should be decided on a case by case basis depending on the drill and the facility.

The modification to Section 403.8.2.3 is for consistency in terminology in the provisions

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

These are operational requirements for emergency responders, resident and staff safety and will not affect construction costs. The modification to 403.8.2.3 is terminology only. The modification to 405.2 is operational. Neither modification will change any building construction requirements.

F28-18

F37-18

IFC: 404.1

Proposed Change as Submitted

Proponent: Joe McElvaney, self, representing Self (joemcelvaney@gmail.com)

2018 International Fire Code

Revise as follows

404.1 General. ~~Where required by Section 403, fire~~ Fire safety, evacuation and lockdown plans shall comply with Sections 404.2 through 404.4.1.

Reason: As currently written section 404 would only apply to those occupancies in section 403 to have fire safety, evacuation and/or lockdown plans.

However section 403 does not required any occupancies to have a lockdown plan.

Plus if an owner wishes to have a fire safety, evacuation plan and/or lockdownplan, it would make sense to use the same requirement/format for those occupancies as outline in section 404

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

This code change will increase the cost of construction, by requiring all occupancies that are required or not required to have a fire safety, evacuation and/or lockdown plan to use the same outline/format as called out in IFC section 404.

F37-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This was disapproved with concern that it will apply the lockdown provisions where they were not intended. Currently the lockdown section applies where lockdown plans are formed but are not required. (Vote: 12-2)

Assembly Action:

None

F37-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Marc Sampson, representing selfrequests As Submitted.

Commenter's Reason: As currently written in the 2018 IFC, section 404.1 points back to section 403 for when to use section 404 for fire safety, evacuation and/or lock-down plans, however there are no requirements for lock-downs in section 403. Thus the code user can never get back to contents of section 404 for a lock down plan.

This code change removes the reference to Section 403 and allows lock-down plans to be developed per section 404.

To address the committee's concern that lock-down provisions would be applied where not intended, as previously stated there are no requirements for lock-downs in section 403.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Based on proponent original code change content

F37-18

F38-18

IFC: 404.2.2

Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com); William Kramer, School District of Philadelphia, representing School District of Philadelphia (wkramer@philasd.org)

2018 International Fire Code

Revise as follows

404.2.2 Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.
2. The life safety strategy including the following:
 - 2.1. Procedures for notifying occupants, including areas with a private mode alarm system.
 - 2.2. Procedures for occupants under a defend-in-place response.
 - 2.3. Procedures for evacuating occupants, including those who need evacuation assistance.
3. Site plans indicating the following:
 - 3.1. The occupancy assembly point.
 - 3.2. The locations of fire hydrants.
 - 3.3. The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
 - 4.1. Exits.
 - 4.2. Primary evacuation routes.
 - 4.3. Secondary evacuation routes.
 - 4.4. Accessible egress routes.
 - 4.4.1. Areas of refuge.
 - 4.4.2. Exterior areas for assisted rescue.
 - 4.5. Refuge areas associated with *smoke barriers* and *horizontal exits*.
 - 4.6. Manual fire alarm boxes.
 - 4.7. Portable fire extinguishers.
 - 4.8. Occupant-use hose stations.
 - 4.9. Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.
8. Exterior doors shall be identified on plans with the exposure side alphabetical prefix that coincides with the National Incident Management System exterior Incident command system (ICS) division designation coupled with sequential numeric door number assignments.

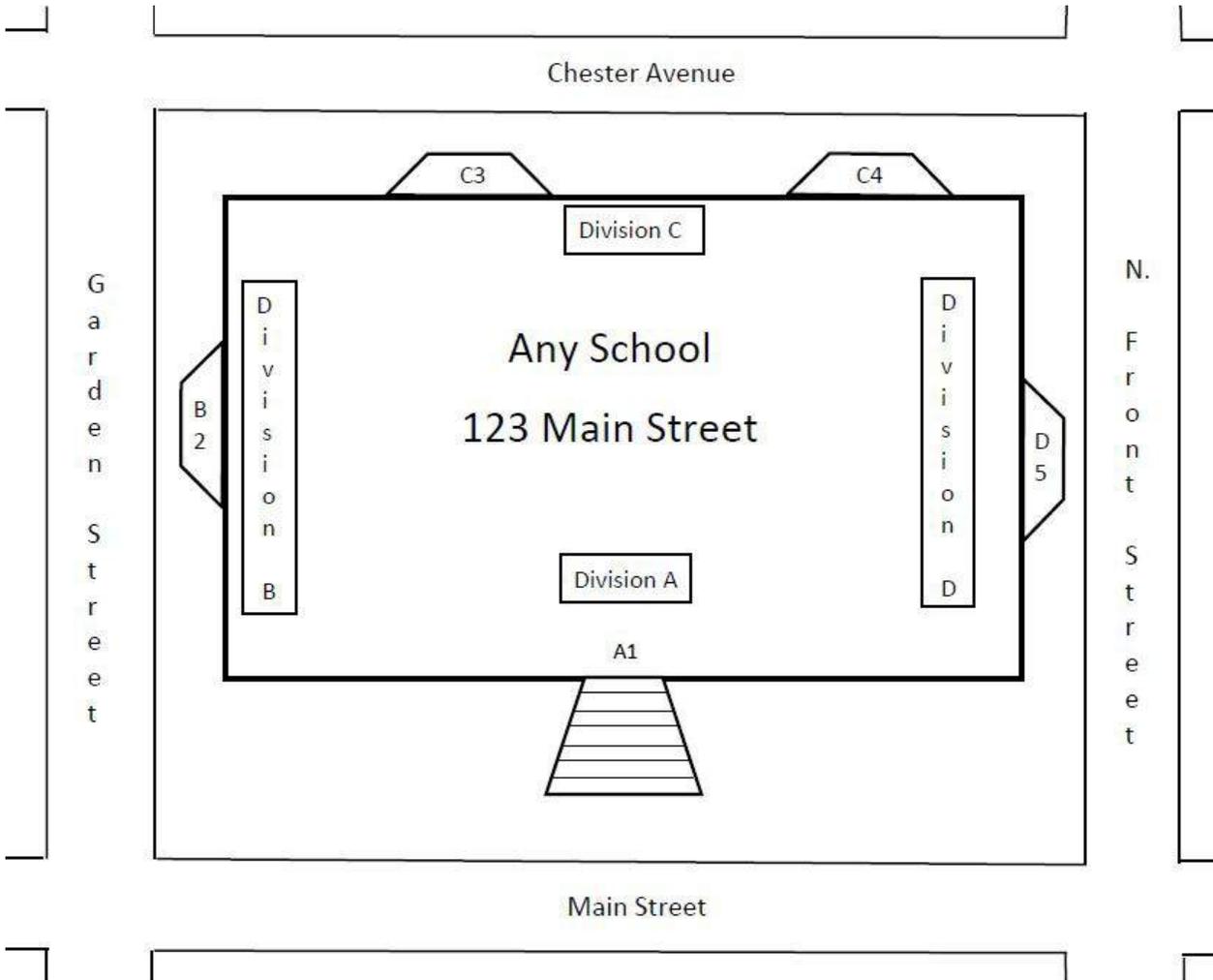
Reason: The IFC does not include recommendations for exterior door numbering that is in compliance with incident management procedures. Due to the lack this being addressed in the IFC for emergency planning purposes a number of agencies have developed recommendations that are not in compliance with NIMS. The most common recommendation starts with the main entrance door being labeled as 1, and then sequentially clockwise around the building. In an emergency situation, especially one that requires mutual aid, it is imperative that we know where our assignments are. In addition, should we run into an emergency inside a building we need to be able to quickly identify where the person in need is located. By failing to utilize the geographic locations of ICS we have failed to ensure a quick, effective and safe response.

A simple fix is to require that a prefix be utilized that coincides with the exterior ICS division designations. Therefore, the main entrance would be Door A1. From a response perspective if I am responding to an active shooter situation, or other emergency, in a school and I am ordered to report to Door 4, I have no idea where that is. However, if I am ordered to report to Door C4 I know it is in the rear of the building. Likewise, if I am an officer in need of assistance from inside a

building and can see an exit door that is labeled from the inside, if it is Door 5, no one except those familiar with the building will know where that is. If however, that same door is labeled D5, everyone knows it is on the right side of the building.

The adoption of a nationwide system of managing incidents and events starts with the basic knowledge that everyone is speaking the same language. That starts with the geographic divisions of an incident. Therefore, the simple addition of adding a prefix and number for exterior doors of a building and requiring them to be labeled inside and outside, is paramount for officer and occupant safety. I am requesting that the ICC consider adding these requirements to the IFC.

This proposal adds a requirement that in preparing fire safety plans the exterior doors be designated and indicated utilizing alphanumeric designations coinciding with the ICS division side and the sequential door number.



Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal has no impact on the cost of construction. It has a minimal cost impact on the preparation of fire safety plans.

F38-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved based on the need for more specific information such as stroke size for the identification. Also, there was concern that, as written, this proposal only addresses the plans and not the building itself. (Vote: 10-4)

Assembly Action:

None

F38-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)requests As Submitted.

Commenter's Reason: The committees disapproval was as follows:
The proposal was disapproved based on the need for more specific information such as stroke size for the identification. Also, there was concern that, as written, this proposal only addresses the plans and not the building itself. (Vote: 10-4)

The reasons centered around the fact that the proposal does not call for marking of doors to correspond to the NIMS division designations.

That omission was intentional because requiring address posting or door numbering has always been controversial and because in this case it is unnecessary. The marking would be optional, but if marking occurs it should meet the needs of emergency responders. Currently with no guidance marking occurs with no relation to the NIMS training utilized by emergency responders.

The proposal is that the emergency plans utilize this numbering scheme for recognition by emergency responders. NIMS ICS training is mandatory for all active emergency service personnel which includes recognition of alphabetical division designations. This occurs at emergency scenes whether or not a building even has an emergency action plan. When you couple a door number with a division designation the emergency responder simply counts doors from one edge of the division side to the other.

The other benefit of not requiring the doors to be marked, the renumbering designation occurs on paper. Not replacing existing markings other than those cases where confusing designations and marking have already occurred and those locations should make the minimal expenditure to renumber their doors.

Facility staff involved in emergency response should also be receiving NIMS training which means they should have no difficulty understanding and applying this requirement.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal has no impact on the cost of construction. It has a minimal cost impact on the preparation of fire safety plans.

F38-18

F43-18

IFC: 508.1.6; IBC: 911.1.6

Proposed Change as Submitted

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2018 International Fire Code

Revise as follows

508.1.6 Required features. The *fire command center* shall comply with NFPA 72 and shall contain the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *interior exit stairway* doors simultaneously.
8. Sprinkler valve and water-flow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, *fire protection systems*, fire-fighter air-replenishment systems, fire-fighting equipment and fire department access, and the location of *fire walls*, *fire barriers*, *fire partitions*, *smoke barriers* and smoke partitions.
13. An *approved* Building Information Card that includes, but is not limited to, all of the following information:
 - 13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and the estimated building population during the day, night and weekend;
 - 13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer and their respective work phone number, cell phone number and e-mail address;
 - 13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns and roof assembly;
 - 13.4. *Exit access stairway* and *exit stairway* information that includes: number of *exit access stairways* and *exit stairways* in building; each *exit access stairway* and *exit stairway* designation and floors served; location where each *exit access stairway* and *exit stairway* discharges, *interior exit stairways* that are pressurized; *exit stairways* provided with emergency lighting; each *exit stairway* that allows reentry; *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks;
 - 13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service;
 - 13.6. *Fire protection system* information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of *automatic sprinkler systems* installed including but not limited to dry, wet and pre-action;
 - 13.7. Hazardous material information that includes: location and quantity of hazardous material.
14. Work table.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1/CSA B44.
18. Elevator emergency or standby power selector switch(es) (labelled "elevator emergency power"), where emergency or standby building power is provided and the emergency or standby building power is provided not sufficient to operate all elevators and associated equipment simultaneously.

2018 International Building Code

[F] 911.1.6 Required features. The fire command center shall comply with NFPA 72 and shall contain all of the following features:

1. The emergency voice/alarm communication system control unit.
2. The fire department communications system.
3. Fire detection and alarm system annunciator.
4. Annunciator unit visually indicating the location of the elevators and whether they are operational.
5. Status indicators and controls for air distribution systems.
6. The fire fighter's control panel required by Section 909.16 for smoke control systems installed in the building.
7. Controls for unlocking *interior exit stairway* doors simultaneously.
8. Sprinkler valve and waterflow detector display panels.
9. Emergency and standby power status indicators.
10. A telephone for fire department use with controlled access to the public telephone system.
11. Fire pump status indicators.
12. Schematic building plans indicating the typical floor plan and detailing the building core, *means of egress*, fire protection systems, fire fighter air replenishment system, fire-fighting equipment and fire department access and the location of *fire walls, fire barriers, fire partitions, smoke barriers* and smoke partitions.
13. An *approved* Building Information Card that contains, but is not limited to, the following information:
 - 13.1. General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor), and the estimated building population during the day, night and weekend.
 - 13.2. Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager and building engineer and their respective work phone number, cell phone number, e-mail address.
 - 13.3. Building construction information that includes: the type of building construction including but not limited to floors, walls, columns, and roof assembly.
 - 13.4. *Exit access* and *exit stairway* information that includes: number of *exit access* and *exit stairways* in the building, each *exit access* and *exit stairway* designation and floors served, location where each *exit access* and *exit stairway* discharges, *interior exit stairways* that are pressurized, *exit stairways* provided with emergency lighting, each *exit stairway* that allows reentry, *exit stairways* providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby, location of freight elevator banks.
 - 13.5. Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator, location of natural gas service.
 - 13.6. Fire protection system information that includes: location of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers, location of different types of *automatic sprinkler systems* installed including, but not limited to, dry, wet and pre-action.
 - 13.7 Hazardous material information that includes: location of hazardous material, quantity of hazardous material.
14. Work table.
15. Generator supervision devices, manual start and transfer features.
16. Public address system, where specifically required by other sections of this code.
17. Elevator fire recall switch in accordance with ASME A17.1/BSA 44.
18. Elevator emergency or standby power selector switch(es) (labelled "elevator emergency power"), where emergency or standby building power is provided and the emergency or standby building power is provided not sufficient to operate all elevators and associated equipment simultaneously.

Reason: To clarify that no switch is needed if the emergency or standby power is sufficient to operate all elevators and associated equipment simultaneously.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
To change to cost since it is a clarification

Public Hearing Results

Errata: [F] 911.1.6 Required features. The fire command center shall comply with NFPA 72 and shall contain all of the following features:
(Items 1-17 unchanged)

18. Elevator emergency or standby power selector switch(es) (labelled "elevator emergency power"), where emergency or standby building power is ~~provided,~~ provided and the emergency or standby building power is not sufficient to operate all elevators and associated equipment simultaneously.

Committee Action:

Disapproved

Committee Reason: The proposal was disapproved as more justification was needed from the proponent and specifically there was concern with how this would work with Occupant evacuation elevators (OEE) since those elevators would need to be available during an entire event. (Vote: 13-1)

Assembly Action:

None

F43-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org) requests As Submitted.

Commenter's Reason: Request approval as submitted. This change was submitted by NEII but was also reviewed by the ASME Code Coordination committee which includes members from ICC and NFPA. This proposal will clarify when a switch is required for emergency or standby power and its operation.

The current language requires a selector switch anytime emergency or standby power is provided. The purpose of the switch is to allow the firefighter to select which elevator or elevators receive the emergency or standby power. In some cases, the emergency or standby power is sufficient to power all of the elevators at once; therefore, there is no need for a selector switch. In fact, requiring the switch when none is needed may create confusion in an emergency. The proposed language would clarify that the switch is only required when the emergency or standby power is insufficient to power all elevators at one time.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. This change would reduce the cost of construction because the selector switch would not be required when emergency or standby power is sufficient to power all elevators at once.

F43-18

F47-18

IFC: 510.1.1, 510.1.1.1

Proposed Change as Submitted

Proponent: Adria Reinertson, Riverside County Fire Department, representing Riverside County Fire Department, California Fire Chiefs Association (adriar@moval.org)

2018 International Fire Code

Add new text as follows

510.1.1 Building conduit and pathway survivability. All new buildings shall be constructed with not less than a two-inch (2") dedicated conduit raceway or other method approved by the fire code official for future expandability, or the installation of an Emergency Responder Radio Coverage System. The raceway shall meet pathway survivability requirements in NFPA 1221 and shall be installed from the lowest floor level to the roof.

510.1.1.1 Identification. The raceway and junction boxes shall be labeled "Emergency Responder Radio Coverage System use only".

Reason: Communications are key to a successful response to an emergency incident. When emergency responder radio coverage systems are installed in a new building they are tested and approved for the conditions present at the time. Often times, as additional buildings and infrastructure are built in the immediate and adjacent vicinity, the original radio coverage system will no longer function as approved due to interference, etc. This proposal requires a dedicated raceway to be installed at time of construction to allow for future expandability and/ or the installation of a radio coverage system. This proposal would allow for easy expansion and/or installations without the additional cost of invasive retrofits to the original system.

Cost Impact: The code change proposal will increase the cost of construction. This code change will increase the cost of construction, however, it will greatly reduce the cost of future installations and/or retrofits for expandability.

F47-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as this requirement seemed excessive and would apply to all buildings regardless of size or features. In addition, it was noted that perhaps Section 510.5.1.1 dealing with installation may be a better location for such a requirements. Also, NFPA 1221 does not establish when pathway survivability is required and a sprinklered building is already considered to have level 1 pathway survivability. Therefore a level of protection is already provided in many buildings without conduit. (Vote 13-1)

Assembly Action:

None

F47-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Adria Reinertson, representing Riverside County Fire Department, California Fire Chiefs Association (adriar@moval.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

510.1.1 510.5.3 Building conduit and pathway survivability. All new buildings shall be constructed with not less than a two-inch (2") dedicated conduit raceway or other method approved by the fire code official for future expandability, or the installation of an Emergency Responder Radio Coverage System. The raceway shall meet pathway survivability requirements in NFPA 1221 and shall be installed from the lowest floor level to the roof.

510.1.1.1 510.5.3.1 Identification. The raceway and junction boxes shall be labeled "Emergency Responder Radio Coverage System use only".

Commenter's Reason: The installation requirements for an Emergency Responder Radio Coverage System can be expensive and obtrusive, if installed after the building construction has been completed. This proposal provides for the basic pathway to be pre-installed, to reduce time and cost of installing an Emergency Responder Radio Coverage System by installing the initial pathway in the building.

The installation requirements are found in Section 510 and related requirement are in NFPA 1221. NFPA 1221 requires communications and signal circuits to be identified. NFPA 1221 has the following requirements:

5.5.5.3 Communications and signal circuits shall be identified by the use of a distinctive color on covers or doors.

5.5.5.4 The words "emergency communication-signal circuit" shall be clearly marked on all terminal and junction locations to prevent unintentional interference.

This Public Comment moves the proposed sections into the installation requirements section as recommended comments from the Code Development Committee. This proposal brings the communication and signaling circuit identification requirement into the International Fire Code.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This code change will increase the cost of construction due to the requirement to install conduit for future use, however, it will greatly reduce the cost of future installations and/or retrofits for expandability.

F47-18

F49-18

IFC: 202 (New), 510.4.1

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (FCAC@iccsafe.org)

2018 International Fire Code

Add new definition as follows

CRITICAL AREAS. Areas that are designated for emergency responder radio coverage including exit stairs, exit passageways, elevator lobbies, fire protection equipment room and control valve locations, fire command centers and other areas identified by the fire code official.

Revise as follows

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have acceptable emergency responder communications enhancement system coverage when signal strength measurements in 95 percent of all areas and 99 percent in critical areas on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

Reason: This is one of 10 proposals being submitted as a package relating to technical changes proposed for Section 510. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals. 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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This proposal clarifies existing requirements within the 2018 edition of Section 510 through a reference to NFPA 1221 by placing the language related to 99% in critical areas within the technical provisions of 510.4.1. Covering critical areas of a building is vital to the operations of public safety responders. A definition for "critical areas" has been included under a separate proposal and includes such areas as exit stairways, elevator lobbies, fire pump rooms, etc.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This is already required in NFPA 1221 already requires this. Section 510.4.2 requires compliance with NFPA 1221.

F49-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon concern that requiring 99 percent will do little to improve the performance from the current criteria of 95%. In addition the definition uses the term "other areas" and it is unclear as to how those areas will be determined. (Vote 11-3)

Assembly Action:

None

F49-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

510.4.1 Emergency responder communication enhancement system signal strength. The building shall be considered to have acceptable emergency responder communications enhancement system coverage when signal strength measurements in 95 percent of all areas and 99 percent in ~~critical areas~~ areas designated as critical areas by the fire code official on each floor of the building meet the signal strength requirements in Sections 510.4.1.1 through 510.4.1.3.

CRITICAL AREAS. Areas that are designated for the highest level of emergency responder radio coverage including but not limited to areas such as exit stairs, exit passageways, elevator lobbies, fire protection equipment room and control valve locations, fire command centers ~~and other areas identified by the fire code official.~~

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This proposal clarifies existing requirements within the 2018 edition of Section 510 through a reference to NFPA 1221 by placing the language related to 99% in critical areas within the technical provisions of 510.4.1. Covering critical areas of a building is vital to the operations of public safety responders. A definition for "critical areas" has been included to clarify what is intended by that term. As the definition notes critical areas include such areas as exit stairways, elevator lobbies, fire pump rooms and fire command centers.

New information: The committee stated that this change proposal would impose new/higher requirements of 99% coverage for critical areas. This public comment is not adding new or higher requirements. Rather it is simply eliminating a technical difference with current requirements in the 2016 and soon to be published 2019 edition of NFPA 1221 for critical areas. NFPA 1221 is referenced standard in the IFC and the intent is to harmonize the technical requirements between the IFC and NFPA 1221

This public comment retains the definition for critical areas. The definition provides a simple explanation for areas that are typically designated as "critical" for firefighter emergency communication to both transmit and receive emergency messages on their portable radios.

Critical areas are absolutely necessary to have 99% RF coverage for firefighter/emergency responder safety in these very specific areas within the building. These are areas where firefighters typically: manage operations (fire command centers), use to reach fire locations, stage for suppression operations, use to access and rescue trapped occupants or monitor/control critical fire protection systems.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of

construction

This is already required in NFPA 1221. Section 510.4.2 requires compliance with NFPA 1221.

F49-18

F63-18

IFC: 603.3, 603.3.1, 603.3.1.1 (New), 603.3.2, 603.3.2.1, 603.3.2.2, 603.3.2.3, 603.3.2.4, 603.3.2.5, 603.3.2.6, 603.3.2.7, 603.3.3, Chapter 80

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

603.3 Fuel oil storage systems. Fuel oil storage systems for building heating systems shall be installed and maintained in accordance with this code. ~~Fuel-oil Tanks and fuel-oil~~ piping systems shall be installed in accordance with Chapter 13 of the International Mechanical Code.

603.3.1 Fuel oil storage in outside, above-ground tanks. Where connected to a fuel-oil piping system, the maximum amount of fuel oil storage allowed outside above ground without additional protection shall be 660 gallons (2498 L). The storage of fuel oil above ground in quantities exceeding 660 gallons (2498 L) shall comply with NFPA 31.

Add new text as follows

603.3.1.1 Approval. Outside Fuel oil storage tanks shall be in accordance with UL142 or UL 2085.

Revise as follows

603.3.2 Fuel oil storage inside buildings. Fuel oil storage inside buildings shall comply with Sections 603.3.2.1 through 603.3.2.5 or Chapter 57: of this code.

Add new text as follows

603.3.2.1 Approval. Inside Fuel oil storage tanks shall be in accordance with UL 80, UL 142, UL 443, or UL 2085.

Revise as follows

~~603.3.2~~**603.3.2.2 Quantity limits.** One or more fuel oil storage tanks containing Class II or III *combustible liquid* shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142, UL 443, or UL 2085.
2. 1,320 gallons (4996 L) in buildings equipped with an *automatic sprinkler* system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142.
3. 3,000 gallons (11 356 L) in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7 ~~and the room is protected by an automatic sprinkler system in accordance with Section 903.3.1.1 of this code.~~

603.3.2.2 Restricted use and connection. Tanks installed in accordance with Section 603.3.2 shall be used only to supply fuel oil to fuel-burning equipment, generators or fire pumps installed in accordance with Section 603.3.2.4. Connections between tanks and equipment supplied by such tanks shall be made using closed piping ~~systems~~systems in accordance with the International Mechanical Code.

603.3.2.3 Applicability of maximum allowable quantity and control area requirements. The quantity of *combustible liquid* stored in tanks complying with Section 603.3.2 shall not be counted towards the maximum allowable quantity set forth in Table 5003.1.1(1), and such tanks shall not be required to be located in a *control area*.

603.3.2.4 Installation. Tanks and piping systems shall be installed in accordance with Section 915 and Chapter 13, both of the International Mechanical Code, as applicable.

603.3.2.5 Separation. Rooms containing fuel oil tanks for internal combustion engines shall be separated from the remainder of the building by *fire barriers, horizontal assemblies,* or both, with a minimum 1-hour fire-resistance rating with 1-hour fire-protection-rated *opening protectives* constructed in accordance with the International Building Code.

Exception: Rooms containing protected above-ground tanks complying with Section 5704.2.9.7 of this code shall not be required to be separated from surrounding areas.

603.3.2.6 Spill containment. Tanks exceeding ~~55-60~~ gallon (~~208-227~~ L) capacity or an aggregate capacity of 1,000 gallons (3785 L) that are not provided with integral secondary containment shall be provided with spill containment sized to contain a release from the largest tank.

603.3.2.7 Tanks in basements. Tanks in *basements* shall be in accordance with UL 80 and shall be located not more than two stories below grade plane.

603.3.3 ~~Underground storage of fuel oil.~~Fuel oil storage in underground tanks. The storage of fuel oil in underground storage tanks shall comply with UL 58 or UL 1316 and installed in accordance with NFPA 31.

Add new standard(s) follows

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

443-06:

Steel Auxiliary Tanks for Oil-Burner Fuel (with revisions through March 8, 2013)

Reason: This is one of 17 proposals being submitted as a package relating to technical and organizational changes proposed for Chapter 6. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

This proposal provides the following clarity:

1. The scope of these sections is for fuel oil storage systems for building heating systems, not for generators or fire pumps.
2. These sections cover both installation and maintenance.
3. Both tanks and fuel oil piping systems are covered in Chapter 13 of the IMC.
4. Identifies what standards that the fuel oil storage tanks located outside, inside, and underground are required to comply.
5. Adds UL 443, UL 58, and UL 1316 as additional alternative standards for tanks to comply.
6. Correlates in Section 603.3.2.6 the technical requirements with the definitions of containers (a vessel of 60 gallons or less) and tanks (a vessel more than 60 gallons).

CONTAINER. A vessel of 60 gallons (227 L) or less in capacity used for transporting or storing hazardous materials. Pipes, piping systems, engines and engine fuel tanks are not considered to be containers.

TANK. A vessel containing more than 60 gallons (227 L).

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Clarifies existing requirements, and provides additional alternative compliance paths for the tanks.

Analysis: A review of the standard proposed for inclusion in the code, UL 443-06 with revisions through March 8, 2013, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 603.3 Fuel oil storage systems. Fuel oil storage systems ~~for building heating systems~~ shall be installed and maintained in accordance with this code. Tanks and fuel-oil piping systems shall be installed in accordance with Chapter 13 of the International Mechanical Code.

603.3.1.1 Approval. Outside Fuel oil storage tanks shall be in accordance with UL142, ~~or~~ UL 2085., or UL 80.

603.3.2.7 Tanks in basements. Tanks in basements shall be ~~in accordance with UL 80~~ and shall be located not more than two stories below grade plane.

Committee Reason: This proposal was approved for a couple reasons. First it provides a more specific reference to Chapter 13 of the IMC for fuel oil piping. Next it references the appropriate referenced standards with regard to underground tanks. The modifications address several issues. The first is the removal of "building heating systems" as this section is intended to be more broadly scoped to other fuel oil applications. The second addressed a standard that was overlooked when assembling the proposal that is appropriate for outside storage tanks UL 80. (Vote: 14-0)

Assembly Action:

None

F63-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, representing STI/SPFA (jeff.shapiro@intlcodeconsultants.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

603.3.2.1 Approval. Inside Fuel oil storage tanks shall be in accordance with UL 80, UL 142, ~~UL 443,~~ or UL 2085.

603.3.2.2 Quantity limits. One or more fuel oil storage tanks containing Class II or III *combustible liquid* shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142, ~~UL 443,~~ or UL 2085.
2. 1,320 gallons (4996 L) in buildings equipped with an *automatic sprinkler* system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142.
3. 3,000 gallons (11 356 L) in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7 of this code.

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

~~443-06:~~

Steel Auxiliary Tanks for Oil Burner Fuel (with revisions through March 8, 2013)

Commenter's Reason: To my knowledge, there are no active listings for UL 443, and because I understand that the standard does not include requirements related to tank supports, it does not appear suitable for equivalent recognition to UL 80 or other code-recognized tank construction standards.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Since there are no active product listings for this standard, deleting the reference should have no impact on cost.

F63-18

F64-18

IFC: 603.3.2.1

Proposed Change as Submitted

Proponent: Bob Morgan, Fort Worth Fire Department, representing Fort Worth Fire Department

2018 International Fire Code

Revise as follows

603.3.2.1 Quantity limits. One or more fuel oil storage tanks containing Class II or III *combustible liquid* shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142 or UL 2085.
2. 1,320 gallons (4996 L) in buildings equipped with an *automatic sprinkler* system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142- as a listed secondary containment tank. Secondary containment shall be monitored visually or automatically.
3. 3,000 gallons (11 356 L) where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7 and the room is protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1. Secondary containment shall be monitored visually or automatically.

Reason: The current allowance of 1,320 gallons in a single wall tank in a non-Group H occupancy area is simply not consistent with historical practice for such installations and is not equivalent to what is required in Chapter 50 relative to maximum allowable quantities, which would normally only allow up to 240 gallons in a fully sprinklered non-Group H occupancy in a use-closed system.

Additionally, the vast majority of these tanks presently installed inside and outside buildings are of the double-wall type for permanent installations.

Primary concern is the exposure of 1,320 gallons of spilled diesel (fuel oil - Class II combustible liquid) inside a building, resulting in much greater involvement in a fire condition than in the vented interstitial space of a double-wall tank.

The double-wall tank provides an added layer of protection at a reasonable cost and is common industry practice currently, especially when located inside a building.

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

The vast majority of fuel tanks associated with generators and fire pumps are of the double-wall type presently; however, being that the code currently allows these to be of the single wall type for the maximum 1,320 gallon designated quantity, the requirement of double-wall would be an increase in the cost of construction as a result.

F64-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: This proposal was approved as it was felt necessary that if secondary containment is provided that it needs to be monitored. (Vote: 11-2)

Assembly Action:

None

F64-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, representing STI/SPFA (jeff.shapiro@intlcodeconsultants.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

603.3.2.1 Quantity limits. One or more fuel oil storage tanks containing Class II or III *combustible liquid* shall be permitted in a building. The aggregate capacity of all tanks shall not exceed the following:

1. 660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142 or UL 2085.
2. 1,320 gallons (4996 L) in buildings equipped with an *automatic sprinkler* system in accordance with Section 903.3.1.1, where stored in a tank complying with UL 142. The tank shall be listed as a listed secondary containment tank, ~~Secondary, and the secondary~~ and the secondary containment shall be monitored visually or automatically.
3. 3,000 gallons (11 356 L) where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7 and the room is protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1. ~~Secondary~~The tank shall be listed as a secondary containment tank, as required by UL 2085, and the secondary containment shall be monitored visually or automatically.

Commenter's Reason: The recommended change correlates the sentence structures in Items 2 and 3 for consistency. UL 2085 tanks require secondary containment, but the text in Item 3, as initially approved, could lead to questions since Item 2 clearly requires secondary containment vs. Item 3, which silently relies on someone knowing that UL 2085 requires secondary containment as part of the listing.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The expected cost increase was documented in the original proposal. The public comment is consistent with the original cost statement.

F64-18

F65-18

IFC: 603.4, 603.4.2.1, 603.4.2.1.1, 603.4.2.2, 603.4.2.2.1, 603.4.2.2.2, 603.4.2.2.3, 603.4.2.2.4, Chapter 80

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 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 and ambulatory care facilities.

Exceptions:

1. ~~In one- and two-family dwellings portable~~ Portable unvented fuel-fired heaters ~~, where approved and listed in accordance with UL 647 are permitted to be used in one- and two-family dwellings, where operated and maintained in accordance with the manufacturer's instructions.~~
2. Portable outdoor gas-fired heating appliances in accordance with Section 603.4.2.

Revise as follows

603.4.2.1 Location. Portable outdoor gas-fired heating appliances shall be used and located in accordance with Sections 603.4.2.1.1 through 603.4.2.1.4.

603.4.2.1.1 Prohibited locations. The storage or use of portable outdoor gas-fired heating appliances is prohibited in any of the following locations:

1. Inside of any occupancy where connected to the fuel gas container.
2. Inside of tents, canopies and membrane structures.
3. On exterior balconies.

Exception: ~~As allowed permitted in Section 6.22 of NFPA 58 Chapter 61 of this code.~~

603.4.2.2 Installation-Use and operation. Portable outdoor gas-fired heating appliances shall be ~~installed~~ used and operated in accordance with Sections 603.4.2.2.1 through 603.4.2.2.4.

603.4.2.2.1 Listing and approval. Only *listed and approved* portable outdoor gas-fired heating appliances utilizing a fuel gas container that is integral to the appliance shall be used. Portable outdoor gas-fired heating appliances shall be listed and labeled in accordance with ANSI Z83.26/CSA 2.37 or ANSI Z21.58/CSA 1.6.

603.4.2.2.2 Installation-Use and maintenance. Portable outdoor gas-fired heating appliances shall be ~~installed~~ used and maintained in accordance with the manufacturer's instructions.

Delete without substitution

~~**603.4.2.2.3 Tip-over switch.** Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.~~

~~**603.4.2.2.4 Guard against contact.** The heating element or combustion chamber of portable outdoor gas-fired heating appliances shall be permanently guarded so as to prevent accidental contact by persons or material.~~

Add new standard(s) follows

ANSI

American National Standards
Institute
25 West 43rd Street, 4th Floor
New York NY 10036

ANSI Z83.26/CSA 2.37-2014:

Gas-Fired Outdoor Infrared Patio Heaters

Outdoor Cooking Gas Appliances

Reason: This is one of 17 proposals being submitted as a package relating to technical and organizational changes proposed for Chapter 6. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

This proposal addresses the following for portable unvented heaters and outdoor gas-fired heating appliances:

1. Replaces "installed" with "used", because these are portable products.
2. For listed portable unvented heaters in one- and two-family dwellings, the fire code official will not be present to approve the use. The requirements have been expanded to also require these heaters to be operated and maintained in accordance with the manufacturer's instructions, which are part of the listing of the heater.
3. Adds specific standards for the portable outdoor gas-fired heating appliances.
4. Removes the tip-over switch requirement (Section 603.4.2.2.3) because this is already a requirement in ANSI Z83.26/CSA 2.37 (Section 5.19). The listing standard includes a performance test to determine.
5. Removes the guard requirement (Section 603.4.2.2.4) because this is already a requirement in ANSI Z83.26/CSA 2.37 (Section 5.14). The listing standard includes requirements addressing accessibility to any heated surface (Section 5.14).

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction
Clarifies already existing requirements.

Analysis: A review of the standards proposed for inclusion in the code, ANSI Z83.26/CSA 2.37-2014 and ANSI Z21.58/CSA 1.6-2015, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 603.4.2.2.3 Tip-over switch. Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if the appliance is tilted more than 15 degrees (0.26 rad) from the vertical.

603.4.2.2.4 Guard against contact. The heating element or combustion chamber of portable outdoor gas-fired heating appliances shall be permanently guarded so as to prevent accidental contact by persons or material.

Committee Reason: This proposal was approved based upon proponents reason. There was some concern that the reference to the standard may lose the provisions related to tip over and therefore the proposal was modified to retain Section 603.4.2.2.3 and 603.4.2.2.4 which are existing IFC sections. Note there was some concern with the reference to a cooking standard (ANSI Z21.58/CSA 1.6-2015: Outdoor Cooking Gas Appliances) within a section focused upon heating requirements. (Vote: 10-3)

Assembly Action:

None

F65-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

603.4.2.2.1 Listing and approval. Only *listed* and *approved* portable outdoor gas-fired heating appliances utilizing a fuel gas container that is integral to the appliance shall be used. Portable outdoor gas-fired heating appliances shall be listed and labeled in accordance with ANSI Z83.26/CSA 2.37. ~~or Z21.58/CSA 1.6.~~

Commenter's Reason: The modification that was made to F65-18 at the code hearings, which brings back the requirement for a tip-over switch in 603.4.2.2.3, now renders all grills listed and labeled to Z21.58 to be in violation of that section. Grills constructed to ANSI Z21.58 Outdoor Cooking Gas Appliances are required to undergo a tipping test to make sure they don't tip over when the angle of tip is 15 degrees from the vertical. However, grills listed to Z21.58 are not required to have a tip-over switch installed in them. Therefore, this change is needed in order for listed gas-fired grills to continue to be used.

In addition, there are other possibilities for gas-fired heating appliances to be used outdoors. Two additional standards that can be referenced are ANSI Z21.63 Portable Type Gas Camp Heaters and ANSI Z21.103 Unvented Portable Type Gas Camp Heaters for Indoor and Outdoor Use. Both of these standards have tip-over provisions that would allow compliance with 603.4.2.2.3 in the form that it is proposed for modification. However, due to ICC regulations, those standards may not be proposed until the next cycle.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal will not increase or decrease the cost of construction. It is simply not relevant as it is only focused on portable heaters.

Public Comment 2:

Proponent: Bruce Swiecicki, representing National Propane Gas Association (bswiecicki@npga.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

603.4.2.2.3 Tip-over switch. Portable outdoor gas-fired heating appliances shall be equipped with a tilt or tip-over switch that automatically shuts off the flow of gas if before the appliance is tilted more than 15 degrees (0.26 rad) to the

minimum angle of critical balance from the vertical which would result in the appliance tipping over.

Commenter's Reason: The standard that is referenced in 603.4.2.2.1, ANSI Z83.26, as well as ANSI Z21.63 and ANSI Z21.103, have provisions to address tip-over. The provisions in Z83.26 and Z21.103 establish the angle of critical balance, which is defined in those standards as the minimum angle through which a heater must be tipped to cause it to tip over due solely to the force of gravity.

This angle will often exceed 15 degrees from the vertical but even if it is less than that, the important thing is that the tip-over switch will activate before the appliance is tipped to the angle of critical balance. The significance of this proposal is that 15 degrees from the vertical is an arbitrary number and it is more relevant to link tip-over activation to the angle of critical balance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal will not impact the cost of construction.

F65-18

F67-18

IFC: 603.10, 603.10.1, 603.10.2

Proposed Change as Submitted

Proponent: Richard Boisvert, Brighton Area Fire Authority, representing Michigan Fire Inspector's Society (rboisvert@brightonareafire.com)

2018 International Fire Code

Add new text as follows

603.10 Clothes dryer exhaust ducts. Clothes dryer exhaust ducts shall be in accordance with Sections 603.10.1 and 603.10.2.

603.10.1 Installation. Clothes dryer vent ducts shall be installed and maintained in accordance with the International Mechanical Code and the manufacturer's installation instructions.

603.10.2 Maintenance. The lint trap, mechanical and heating components, and the exhaust duct system of a clothes dryer shall be maintained to prevent the accumulation of lint or debris that prevents the exhaust of air, products of combustion or that creates a fire hazard.

Reason: Th IFC does not specifically address clothes dryer exhaust duct system installation and maintenance. The addition of this section creates a clear code path to ensure these duct systems are maintained to prevent fires.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change will not affect the cost of construction, however, it will require additional maintenance costs to maintain them following installation.

F67-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon concerns that the enforcement will be problematic. In addition, there was concern as to determining how often it would need to be inspected. The reference to the manufacturers instructions may be subjective. It was also pointed out that this is not specific to any occupancy and should be narrowed down. There was some support by the committee with some modification to reflect exhaust systems. It was also felt that potentially this could be a necessary tool for enforcement as this is a fire hazard. (Vote: 7-6)

Assembly Action:

None

F67-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

610 CLOTHES DRYER EXHAUST SYSTEMS

~~603.10~~ **610.1 Clothes dryer exhaust duct systems.** Clothes dryer exhaust ducts shall duct systems shall be in accordance with Sections 603.10.1 and 603.10.2.

~~603.10.1~~ **610.1.1 Installation.** Clothes dryer vent ducts shall be installed and maintained in exhaust duct systems shall be installed in accordance with the International Mechanical Code, or the International Fuel Gas Code, and the manufacturer's installation instructions.

~~603.10.2~~ **610.1.2 Maintenance.** The lint trap, mechanical and heating components, and the exhaust duct system of a clothes dryer shall be ~~maintained~~ maintained in accordance with the manufacturer's operating instructions to prevent the accumulation of lint or debris that prevents the exhaust of air, ~~products and products~~ of combustion ~~or that creates a fire hazard.~~

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This modification addresses the concern raised by the Technical Committee. There are many statistics published each year regarding clothes dryer fires, such as NFPA, CPSC, and USFA. There are approximately 15,600 structure fires, 400 injuries, and 15 deaths reported annually as a result of dryer fires. According to the United States Fire Administration, every year clothes dryer fires account for over \$100 million in losses. Also, dryer fires involving commercial dryers have a 78% higher injury rate than residential dryer fire. A majority of dryer fires occur as a result of highly flammable lint getting caught in the dryer's vent and becoming heated to the point of ignition. While many of the statistics address residential applications, there are also some statistics that identify issues in commercial applications, too.

Thus, maintaining of clothes dryers and the clothes dryer exhaust duct systems in any occupancy using clothes dryers is critical to reducing the fire hazard. The Mechanical, Fuel Gas, and Residential Codes require commercial and residential clothes dryers to be listed and labeled, and to be installed in accordance with the manufacturer's installation instructions. The required product testing standards include requirements for specific cleaning and maintenance directions to be part of the manufacturer's installation and use instructions.

The frequency for inspections depends on various factors, such as how often the dryer is used, the geometry of the exhaust duct system, and the age and type of dryer.

The proposal is modified as follows:

1. Establish a new stand-alone section in Chapter 6 for clothes dryer exhaust duct systems, because these potential hazards are present regardless of what the source of power or fuel for drying the clothes.
2. Use the term “exhaust duct system”, which is consistent with the terms used in the Mechanical, Fuel Gas, and Residential codes. These systems include the termination outlet and may include dryer exhaust duct power ventilators, which are also known as booster fans.
3. Expand the installation codes to also include the Fuel Gas Code for the gas-fired clothes dryers.
4. The Mechanical Code does not include maintenance requirements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This change will not affect the cost of construction, however, it will require additional maintenance costs to maintain them following installation.

F67-18

F69-18

IFC: 604.1.1

Proposed Change as Submitted

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

2018 International Fire Code

Add new text as follows

604.1.1 Healthcare facilities. In Group I-2 facilities, ambulatory care facilities and outpatient clinics, the electrical systems and equipment shall be maintained and tested in accordance with NFPA 99.

Reason: In order to meet federal conditions of participation health care facilities must comply with the electrical systems and equipment must be maintenance and testing requirements listed in NFPA 99, Health Care Facilities Code (K913). This change will align the electrical systems maintenance and testing requirements for Outpatient Clinics, Group B Ambulatory Care and Group I-2 facilities.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to 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 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes.* Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change is an operational change regarding maintenance and testing. This will not increase the cost of construction on the healthcare industry.

F69-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This was disapproved as it does not correlate with the essential electrical requirements in chapter 4 of the of the IBC. This reference to NFPA 99 in this proposal has broader application in the IFC which seems beyond the scope of application of this code.. (Vote: 12-2)

Assembly Action:

None

F69-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, representing Healthcare Committee (ahc@iccsafe.org)requests As Submitted.

Commenter's Reason: This proposal is intended to reference the maintenance and testing requirements of NFPA 99 and not the new construction requirements. IBC Section 422.6 covers installation according to NFPA 99 for ambulatory care and IBC Section 407.11 covers Group I-2. We want to make systems that are installed according NFPA per IBC are properly maintained. We need this for alignment with CMS conditions of participation in the IFC.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This change is an operational change regarding maintenance and testing. This will not increase the cost of construction on the healthcare industry.

F69-18

F76-18

IFC: 605.1.2, Chapter 80

Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com)

2018 International Fire Code

Revise as follows

605.1.2 Ammonia refrigeration. Refrigeration systems using ammonia refrigerant and the buildings in which such systems are installed shall comply with IIAR-2 for system design and installation, IIAR 6 for maintenance and inspection, and IIAR-7 for operating procedures. Decommissioning of ammonia refrigeration systems shall comply with IIAR-8.

Update standard(s) as follows

IIAR

International Institute of Ammonia
Refrigeration
1001 N. Fairfax Street, Suite 503
Alexandria VA 22314
US

IIAR – 2-2014:

Safe Design of Closed-circuit Ammonia ~~Refrigerating~~ Refrigeration Systems

IIAR – 8-2015:

Decommissioning of Closed-circuit Ammonia ~~Refrigerating~~ Refrigeration Systems

IIAR 6-2018:

Standard for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems

Reason: IIAR 6 is a newly developed standard, being produced in accordance with ANSI requirements. It will provide comprehensive model regulations for maintenance and inspection of ammonia refrigeration systems and is part of a comprehensive set of IIAR standards for such systems that have been adopted by the IFC, IMC and other model codes. The first public comment period for this document has been completed, and it is anticipated that the document will be finished in time for adoption by the ICC membership in 2018.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. IIAR 6 is a maintenance and inspection standard for existing ammonia refrigeration systems.

Analysis: A review of the standard proposed for inclusion in the code, IIAR 6—2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F76-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: The committee approved the proposal based upon the need for the maintenance and inspection standard. The proposal also corrects the title to existing standard IAR 2 which is necessary. (Vote: 14-0)

Assembly Action:

None

F76-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com) requests Disapprove.

Commenter's Reason: This public comment is submitted as a contingency in case IAR 6 is not done before the final action hearing, in which case it must be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Not adopting the standard will not impact construction costs.

Public Comment 2:

Proponent: CP28 Administration.

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard(s) IAR 6-2018:Standard for Inspection, Testing, and Maintenance of Closed-Circuit Ammonia Refrigeration Systems, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered. **(CP28) 3.6.3.1.1 Proposed New Standards.** In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing

F76-18

F78-18

IFC: 605.1.2, Chapter 80

Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com)

2018 International Fire Code

Revise as follows

605.1.2 Ammonia refrigeration. Refrigeration systems using ammonia refrigerant and the buildings in which such systems are installed shall comply with IIAR-2 for system design and installation and IIAR-7 for operating procedures. Decommissioning of ammonia refrigeration systems shall comply with IIAR 8, and engineering practices for existing ammonia refrigeration systems shall be in accordance with IIAR 9.

Add new standard(s) follows

IIAR

International Institute of Ammonia
Refrigeration
1001 N. Fairfax Street, Suite 503
Alexandria VA 22314

IIAR 9-2018:

Standard for Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for Existing Closed-circuit Ammonia Refrigeration Systems

Reason: IIAR 9 is a newly developed standard, being produced in accordance with ANSI requirements. It will provide comprehensive model regulations for minimum retroactive safety requirements applicable to ammonia refrigeration systems. It is part of a comprehensive set of IIAR standards for such systems that have been adopted by the IFC, IMC and other model codes. It is anticipated that the document will be finished in time for adoption by the ICC membership in 2018.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The proposed standard does not affect construction. It applies to existing ammonia refrigeration systems.

Analysis: A review of the standard proposed for inclusion in the code, IIAR 9-2018, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F78-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: This proposal was approved as it adds necessary requirements for existing ammonia refrigeration systems through the reference to the new standard IAR9. (Vote: 14-0)

Assembly Action:

None

F78-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Shapiro, representing International Institute of Ammonia Refrigeration (jeff.shapiro@intlcodeconsultants.com) requests Disapprove.

Commenter's Reason: This public comment is submitted as a contingency in case IAR 9 is not done before the final action hearing, in which case it must be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Not adopting the standard will not impact construction costs.

Public Comment 2:

Proponent: CP28 Administration.

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard IAR 9-2018:Standard for Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) for Existing Closed-circuit Ammonia Refrigeration Systems must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing

F78-18

F79-18 Part I

IFC: 202, (New), 605.8, 605.8.1, 605.8.1.1 (New), 605.8.1.2 (New), 605.17.1; IMC: [F]1106.5.1

Proposed Change as Submitted

Proponent: Connor Barbaree, ASHRAE, representing ASHRAE (cbarbaree@ashrae.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IMC COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Fire Code

CHAPTER 2 DEFINITIONS

SECTION 202 GENERAL DEFINITIONS

Add new definition as follows

REFRIGERANT DETECTOR. A device that is capable of sensing the presence of refrigerant vapor.

CHAPTER 6 BUILDING SERVICES AND SYSTEMS

SECTION 605 MECHANICAL REFRIGERATION

[M] 605.1 Scope. Refrigeration systems shall be installed in accordance with the International Mechanical Code.

605.5 Access. 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 be provided for the fire department at all times as required by the *fire code official*.

605.6 Testing of equipment. Refrigeration equipment and 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 subject to periodic testing in accordance with Section 605.6.1. Records of tests shall be maintained. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

605.6.1 Periodic testing. The following emergency devices or systems shall be periodically tested in accordance with the manufacturer's instructions and as required by the *fire code official*.

1. Treatment and flaring systems.
2. Valves and appurtenances necessary to the operation of emergency refrigeration control boxes.
3. Fans and associated equipment intended to operate emergency ventilation systems.
4. Detection and alarm systems.

Revise as follows

605.8 Refrigerant detection. Machinery rooms shall be provided with ~~a refrigerant detector~~ one or more refrigerant detectors capable of detecting the specific refrigerant(s) utilized in the machinery room, with an audible and visible alarm. Where ammonia is used as the refrigerant, detection shall comply with IIAR 2. For refrigerants other than ammonia, refrigerant detection shall comply with Section 605.8.1.

605.8.1 Refrigerants other than ammonia.

A detector, or a sampling tube that draws air to a detector, shall be provided at ~~an one or more approved location~~ locations 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. ~~Twenty-five percent of the lower flammable limit (LFL).~~

Detection of a refrigerant concentration exceeding the 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 605.9.1. detection, signaling and control circuits shall be supervised. The detection system shall be designed in accordance with Sections 605.8.1.1 and 605.8.1.2.

Add new text as follows

605.8.1.1 Low level response. The system shall be designed to perform the following actions when the concentration of refrigerant detected exceeds the smallest value of Occupational Exposure Limit (OEL) and does not exceed the smallest value of Refrigerant Concentration Level (RCL), as listed in the International Mechanical Code for any refrigerant utilized in the machinery room:

1. Initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location.
2. The ventilation system shall provide a flow rate not less than the highest of the following values for any refrigerant utilized in the machinery room: for Group A1 and B1 refrigerants 100% of the normal ventilation quantity, and for Group A2L, A2, A3, B2L, B2, and B3 refrigerants, 50% of the emergency conditions quantity, as required by the International Mechanical Code.
3. After initiation of alarms and ventilation system, it is permissible to utilize automatic reset of alarms and ventilation system after the refrigerant concentration has reduced below the OEL and maintained below the OEL for a minimum of 15 minutes.

605.8.1.2 High level response. The system shall be designed to perform the following actions when the concentration of refrigerant detected exceeds the refrigerant concentration limit (RCL), or 25 percent of the lower flammable limit (LFL), or upper detection limit of the detector, whichever is lower, for any refrigerant utilized in the machinery room:

1. Initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location.
2. The ventilation system shall provide a flow rate not less than 100% of the emergency conditions quantity required by the International Mechanical Code.
3. For Group A2L, A2, A3, B2L, B2, and B3 refrigerants, stop refrigerant equipment in the machinery room in accordance with Section 605.9.1.
4. After initiation, alarms and ventilation system shall continue until manually reset at a location within the machinery room.

Delete without substitution

~~**605.17.1 Refrigerant detection system.** The machinery room shall be provided with a refrigerant detection system. The refrigerant detection system shall be in accordance with Section 605.8 and all of the following:~~

- ~~1. The detectors shall activate at or below a refrigerant concentration of 25 percent of the LFL.~~
- ~~2. Upon activation, the detection system shall activate the emergency ventilation system in Section 605.17.3.~~
- ~~3. The detection, signaling and control circuits shall be supervised.~~

2018 International Mechanical Code

Delete and substitute as follows

~~**[F] 1106.5.1 Refrigerant detection system.** The *machinery room* shall be provided with a refrigerant detection system. The *refrigerant* detection system shall be in accordance with Section 605.8 of the International Fire Code and all of the following:~~

- ~~1. The detectors shall activate at or below a refrigerant concentration of 25% of the LFL.~~
- ~~2. Upon activation, the detection system shall activate the emergency ventilation system required by Section 1106.5.2.~~
- ~~3. The detection, signaling and control circuits shall be supervised.~~

~~**1106.5.1 Refrigerant detection system.** The *machinery room* shall be provided with a refrigerant detection system. The *refrigerant* detection system shall be in accordance with Section 605.8 of the International Fire Code.~~

Reason: The proposed code changes include technical content based on ASHRAE Standard 34-2016 with Addendum G and ASHRAE Standard 15-2016 with Addendum H. The revisions in these two ASHRAE addenda are dependent and must be correlated as shown in this code change proposal. Upon publication, these addenda will be incorporated into the 2019

editions of ASHRAE 34 and ASHRAE 15.

There was a considerable amount of industry research into the use of flammable refrigerants that occurred in 2016 and 2017, following the announcement in June 2016 of a collaborative research effort between ASHRAE, AHRI, and US DOE. ASHRAE SSSPC15 relied upon this body of knowledge, extended upon prior ASHRAE research from 2012, in drafting the addenda to the 2016 edition of Standard 15.

The refrigerant safety group classification is an alphabetical/numerical designation that is used to identify both the toxicity and flammability classifications of a given refrigerant. There are two new safety group classifications added to ASHRAE 34: A2L and B2L. Previously 2L was a sub-class of class 2 as an interim measure to implement changes to refrigerant flammability classification into ASHRAE 34 prior to making associated changes to a future edition of ASHRAE 15; but now 2L is a separate class and safety requirements must be revised to distinguish between class 2 and class 2L.

The current definitions of "flammability classification" and "toxicity classification" are improper since both contain mandatory code requirements. The definitions should only define the term, not contain code requirements with the use of the word "shall." The current definition of refrigerant safety classifications is incorrect due to revisions to ASHRAE 34. The attempt to define the technical requirements of flammability are not correct. ASHRAE 34 goes into extensive requirements as to how to test and classify a refrigerant regarding flammability. The code should leave the technical requirements to ASHRAE 34 which is accomplished in Section 1103.1. The definition only has to identify the meanings of the classification categories. These terms used are found in the body of ASHRAE 34. The addition of "refrigerant" to the term "flammability classification" and "toxicity classification" clarify that the definitions only apply to refrigerants. Flammability and toxicity are terms also used in the ventilation sections of the code. These definitions do not apply to the use of those terms in Chapter 5.

Bibliography: (AHRI) Final Report - AHRI 8005 "Risk Assessment of Class 2L Refrigerants in Chiller Systems", prepared by Bill Goetzler, Matt Guernsey, & Collin Weber (July 2013).

<http://www.ahrinet.org/Resources/Research.aspx>

(ASHRAE 2012) ASHRAE Research Project TRP-1448, "Final Report: Ventilation Requirements for Refrigerating Machinery Rooms", July 2012.

(ASHRAE 2016a) ASHRAE Standard 15-2016 "Safety Standard for Refrigeration Systems" (2016).

(ASHRAE 2016b) ASHRAE Standard 34-2016 "Designation and Safety Classification of Refrigerants" (2016).

(Papas et. al. 2016) Paul Papas, Shiling Zhang, Hai Jiang, Parmesh Verma, Ivan Rydkin, Richard Lord & Larry Burns (2016) Computational fluid dynamics modeling of flammable refrigerant leaks inside machine rooms: Evaluation of ventilation mitigation requirements, Science and Technology for the Built Environment, 22:4, 463-471, DOI:10.1080/23744731.2016.1163240

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This code change proposal addresses a new safety group of refrigerants, with no precedent on the construction costs.

F79-18 Part I

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon a request from the proponent that the standard is not yet complete to address this issue. (Vote: 14-0)

Assembly Action:

None

F79-18 Part I

Individual Consideration Agenda

Public Comment 1:

Proponent: Connor Barbaree, representing ASHRAE (cbarbaree@ashrae.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

CHAPTER 2 DEFINITIONS

SECTION 202 GENERAL DEFINITIONS

REFRIGERANT DETECTOR. A device that is capable of sensing the presence of refrigerant vapor.

CHAPTER 6 BUILDING SERVICES AND SYSTEMS

SECTION 605 MECHANICAL REFRIGERATION

[M] 605.1 Scope. Refrigeration systems shall be installed in accordance with the International Mechanical Code.

605.5 Access. 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 be provided for the fire department at all times as required by the *fire code official*.

605.6 Testing of equipment. Refrigeration equipment and 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 subject to periodic testing in accordance with Section 605.6.1. Records of tests shall be maintained. Tests of emergency devices or systems required by this chapter shall be conducted by persons trained and qualified in refrigeration systems.

605.6.1 Periodic testing. The following emergency devices or systems shall be periodically tested in accordance with the manufacturer's instructions and as required by the *fire code official*.

1. Treatment and flaring systems.
2. Valves and appurtenances necessary to the operation of emergency refrigeration control boxes.
3. Fans and associated equipment intended to operate emergency ventilation systems.
4. Detection and alarm systems.

605.8 Refrigerant detection. Machinery rooms shall be provided with one or more refrigerant detectors capable of detecting the specific refrigerant(s) utilized in the machinery room, with one or more set points that activate responses, with an audible and visible alarm. Where ammonia is used as the refrigerant, detection shall comply with IAR 2. For refrigerants other than ammonia, refrigerant detection shall comply with Section 605.8.1.

605.8.1 Refrigerants other than ammonia. A detector, or a sampling tube that draws air to a detector, shall be provided at one or more approved locations where refrigerant from a leak is expected to accumulate. ~~The detection, signaling and control circuits shall be supervised. The detection system shall be designed in accordance with Sections 605.8.1.1 and 605.8.1 to initiate audible and visible alarms inside and outside of each entrance to the refrigerating~~

machinery room, and transmit a signal to an approved location, where the concentration of refrigerant detected exceeds the lowest value of the occupational exposure limit (OEL) as shown in Table 1103.1 of the International Mechanical Code, corresponding to any refrigerant in the machinery room. For any flammable refrigerants in the machinery room, refrigerant detection shall comply with Section 605.8.2.

~~**605.8.1.1 Low level response.** The system shall be designed to perform the following actions when the concentration of refrigerant detected exceeds the smallest value of Occupational Exposure Limit (OEL) and does not exceed the smallest value of Refrigerant Concentration Level (RCL), as listed in the International Mechanical Code for any refrigerant utilized in the machinery room:~~

- ~~1. Initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location.~~
- ~~2. The ventilation system shall provide a flow rate not less than the highest of the following values for any refrigerant utilized in the machinery room: for Group A1 and B1 refrigerants 100% of the normal ventilation quantity, and for Group A2L, A2, A3, B2L, B2, and B3 refrigerants, 50% of the emergency conditions quantity, as required by the International Mechanical Code.~~
- ~~3. After initiation of alarms and ventilation system, it is permissible to utilize automatic reset of alarms and ventilation system after the refrigerant concentration has reduced below the OEL and maintained below the OEL for a minimum of 15 minutes.~~

~~**605.8.1.2 High level response.** The system shall be designed to perform the following actions when the concentration of refrigerant detected exceeds the refrigerant concentration limit (RCL), or 25 percent of the lower flammable limit (LFL), or upper detection limit of the detector, whichever is lower, for any refrigerant utilized in the machinery room:~~

- ~~1. Initiate audible and visible alarms inside of and outside each entrance to the refrigerating machinery room and transmit a signal to an approved location.~~
- ~~2. The ventilation system shall provide a flow rate not less than 100% of the emergency conditions quantity required by the International Mechanical Code.~~
- ~~3. For Group A2L, A2, A3, B2L, B2, and B3 refrigerants, stop refrigerant equipment in the machinery room in accordance with Section 605.9.1.~~
- ~~4. After initiation, alarms and ventilation system shall continue until manually reset at a location within the machinery room.~~

605.8.2 Flammable refrigerants other than ammonia. Detection of a refrigerant concentration exceeding the refrigerant concentration limit (RCL) value as shown in Table 1103.1 of the International Mechanical Code, or twenty-five percent of the lower flammable limit (LFL), or the upper detection limit, whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 605.9.1. The detection, signaling and control circuits shall be supervised. Multi-port type refrigerant detectors shall be prohibited where using any flammable refrigerant. Group A2L and Group B2L refrigerants, other than ammonia, shall comply with Section 605.8.3.

605.8.3 A2L and B2L refrigerants other than ammonia. Refrigerant detectors for Group A2L and Group B2L refrigerants, other than ammonia, shall meet all of the following conditions:

1. A refrigerant detector shall be capable of detecting each of the specific refrigerant designations in the machinery room.

2. The refrigerant detector shall activate responses within a time not to exceed a limit specified in Table 605.8.3, after exposure to a refrigerant concentration exceeding a limit value specified in Table 605.8.3.

3. The refrigerant detector shall have a set point not greater than the applicable occupational exposure limit (OEL) value as specified in Table 1103.1 of the International Mechanical Code. The applicable OEL value shall be the lowest OEL value for any refrigerant designation in the machinery room. Refrigerants that do not have a published OEL value in the International Mechanical Code shall use the values published in ASHRAE 34, or a value determined in accordance with ASHRAE 34 where approved by the fire code official.

4. The refrigerant detector shall have a set point not greater than the applicable refrigerant concentration limit (RCL) value as specified in Table 1103.1 of the International Mechanical Code. The applicable RCL value shall be the lowest RCL value for any refrigerant designation in the machinery room. Refrigerants that do not have a published RCL value in the International Mechanical Code shall use the values published in ASHRAE 34, or a value determined in accordance with ASHRAE 34 where approved by the fire code official.

5. The refrigerant detector shall provide a means for automatic self-testing. In the event of a failure during a refrigerant detector self-test, a trouble alarm signal shall be transmitted to an approved monitored location. The refrigerant detector shall be tested during installation and annually thereafter, or at an interval not exceeding the manufacturer's installation instructions, whichever is more often. Testing shall verify compliance with the alarm set point(s) and response time(s) in accordance with Table 605.8.3.

6. The type of alarm reset for the refrigerant detector shall be in accordance with Table 605.8.3. Manual reset type

alarms shall have the reset located inside the machinery room. Automatic reset type alarms shall not deactivate until after the refrigerant concentration has been reduced below the OEL and maintained below the OEL for not less than 5 minutes.

**Table 605.8.3
ALARMS FOR GROUP A2L AND B2L REFRIGERANTS OTHER THAN AMMONIA**

<u>Limit Value</u>	<u>Response Time</u>	<u>Alarm Type</u>	<u>Alarm Reset Type</u>
<u>Set Point = OEL or less</u>	<u>300 seconds or less</u>	<u>Trouble Alarm</u>	<u>Automatic</u>
<u>Set Point = RCL or less</u>	<u>15 seconds or less</u>	<u>Emergency Alarm</u>	<u>Manual</u>

605.13 Mechanical ventilation exhaust. 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—Refrigerating systems containing a Group A2L refrigerant and complying with Section ~~605.17~~ 1105.6 of the International Mechanical Code.

2018 International Mechanical Code

~~**1106.5.1 Refrigerant detection system.** The machinery room shall be provided with a refrigerant detection system. The refrigerant detection system shall be in accordance with Section 605.8 of the International Fire Code.~~

Commenter's Reason: ASHRAE SSPC 15 is publishing a modification to ASHRAE Standard 15 that includes new requirements for refrigerant detection for Group A2L refrigerants. The original text of IFC 2018 regarding detectors for Group A2L refrigerants was based on an initial Advisory Public Review (APR) published by ASHRAE in December 2015.

When the ASHRAE SSPC 15 Committee had reviewed all of the comments, they later issued a Publication Public Review (PPR). Through multiple PPRs the detection requirements significantly changed. These proposed modifications are based on the results of input from public comments.

The change will also be consistent with the Public Comment to F79-18, Part II and M88-18. All three of these Public Comments work together in addressing the safety issues when using Group A2L refrigerants.

It is important for the Fire Code to be up-to-date on the use of A2L refrigerants since these refrigerants fall into the category of low global warming potential refrigerants. There will be an increased use of low global warming refrigerants to protect the environment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The change clarifies the detector requirements when using A2L refrigerant in a machinery room. The use of A2L refrigerant remains an option.

F79-18 Part I

F79-18 Part II

IFC: [M]605.16, [M]605.17, [M]605.17.2, TABLE [M] 605.17.2, [M]605.17.3; IMC: 202(New), 1103.1, TABLE 1103.1, 1106.4, 1106.5.2, TABLE 1106.5.2

Proponent: Connor Barbaree, ASHRAE, representing ASHRAE (cbarbaree@ashrae.org)

2018 International Fire Code

Revise as follows:

[M] 605.16 Electrical equipment. Where *refrigerant* of Groups A2L, A2, A3, B2L, 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 605.17, or Group B2L refrigerants that are provided with ventilation in accordance with Section 605.17. Sections 605.12.3 and Section 1106.3 of the International Mechanical Code.

[M] 605.17 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms with systems containing Group A2L refrigerants shall comply with Sections 605.17.1 through 605.17.3. Section 1106.4 of the International Mechanical Code.

Exception: Machinery rooms conforming to the Class 1, Division 2 hazardous location classification requirements of NFPA 70.

Delete without substitution:

~~**[M] 605.17.2 Emergency ventilation system.** An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 605.17.2. Shut down of the emergency ventilation system shall be by manual means.~~

**TABLE [M] 605.17.2
MINIMUM EXHAUST RATE**

REFRIGERANT	Q (m ³ /sec)	Q (cfm)
R32	15.4	32,600
R143a	13.6	28,700
R444A	6.46	13,700
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

~~**[M] 605.17.3 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.~~

2018 International Mechanical Code

CHAPTER 2 DEFINITIONS

SECTION 202 GENERAL DEFINITIONS

Delete and substitute as follows:

~~**FLAMMABILITY CLASSIFICATION.** Refrigerants shall be assigned to one of the three classes—1, 2 or 3—in accordance with ASHRAE 34. For Classes 2 and 3, the heat of *combustion* shall be calculated assuming that *combustion* products are in the gas phase and in their most stable state.~~

~~**Class 1.** Refrigerants that do not show flame propagation when tested in air at 14.7 psia (101 kPa) and 140°F (60°C).~~

~~**Class 2.** Refrigerants having a lower flammability limit (LFL) of more than 0.00625 pound per cubic foot (0.10 kg/m³) at 140°F (60°C) and 14.7 psia (101 kPa) and a heat of combustion of less than 8169 Btu/lb (19 000 kJ/kg).~~

~~**Class 3.** Refrigerants that are highly flammable, having a LFL of less than or equal to 0.00625 pound per cubic foot (0.10 kg/m³) at 140°F (60°C) and 14.7 psia (101 kPa) or a heat of combustion greater than or equal to 8169 Btu/lb (19 000 kJ/kg).~~

~~**FLAMMABILITY CLASSIFICATION (REFRIGERANT).** The alphabetical/numerical designation used to identify the flammability of refrigerants. Class 1 indicates a refrigerant with no flame propagation. Class 2L indicates a refrigerant with lower flammability and lower burning velocity. Class 2 indicates a refrigerant with lower flammability. Class 3 indicates a refrigerant with higher flammability.~~

Add new definition as follows:

~~**REFRIGERANT CONCENTRATION LIMIT (REFRIGERANT) (RCL)** The refrigerant concentration limit, in air, intended to reduce the risks of acute toxicity, asphyxiation, and flammability hazards in normally occupied, enclosed spaces.~~

Delete and substitute as follows:

~~**REFRIGERANT SAFETY CLASSIFICATIONS.** Groupings that indicate the toxicity and flammability classes in accordance with Section 1103.1. The classification group is made up of a letter (A or B) that indicates the toxicity class, followed by a number (1, 2 or 3) that indicates the flammability class. Refrigerant blends are similarly classified, based on the compositions at their worst cases of fractionation, as separately determined for toxicity and flammability. In some cases, the worst case of fractionation is the original formulation.~~

~~**Flammability.** See “Flammability classification.”~~

~~**Toxicity.** See “Toxicity classification.”~~

REFRIGERANT SAFETY GROUP CLASSIFICATION. The alphabetical/numerical designation that indicates both toxicity and flammability classifications of refrigerants.

Toxicity. See "Toxicity classification (Refrigerant)."

Flammability. See "Flammability classification (Refrigerant)."

~~**TOXICITY CLASSIFICATION.** Refrigerants shall be classified for toxicity in one of two classes in accordance with ASHRAE 34:~~

~~**Class A.** Refrigerants that have an occupational exposure limit (OEL) of 400 parts per million (ppm) or greater.~~

~~**Class B.** Refrigerants that have an OEL of less than 400 ppm.~~

TOXICITY CLASSIFICATION (REFRIGERANT). An alphabetical designation used to identify the toxicity of refrigerants. Class A indicates a refrigerant with lower toxicity. Class B indicates a refrigerant with higher toxicity.

CHAPTER 11 REFRIGERATION

SECTION 1103 REFRIGERATION SYSTEM CLASSIFICATION

Revise as follows:

1103.1 Refrigerant classification. Refrigerants shall be classified in accordance with ASHRAE 34 as listed in Table 1103.1. Each refrigerant shall be assigned to one of the following refrigerant safety group classifications: A1, A2L, A2, A3, B1, B2L, B2, or B3. For refrigerants that do not have values in Table 1103.1, the safety group, RCL value, and OEL value shall be determined in accordance with ASHRAE 34 and approved by the code official.

TABLE 1103.1

REFRIGERANT CLASSIFICATION, AMOUNT AND OEL

CHEMICAL REFRIGERANT	FORMULA	CHEMICAL NAME OF BLEND	REFRIGERANT SAFETY GROUP CLASSIFICATION	AMOUNT OF REFRIGERANT PER OCCUPIED SPACE				[F] DEGREES OF HAZARD ^a
				RCL			OEL ^e	
				lb per 1000 ft ³ pounds per 1,000 cubic feet	ppm	g/m ³	ppm	
R-11 ^d	CCl ₃ F	trichlorofluoromethane	A1	0.39	1,100	6.2	C1,000	2-0-0 ^b
R-12 ^d	CCl ₂ F ₂	dichlorodifluoromethane	A1	5.6	18,000	90	1,000	2-0-0 ^b
R-13 ^d	CClF ₃	chlorotrifluoromethane	A1	—	—	—	1,000	2-0-0 ^b
R-13B1 ^d	CBrF ₃	bromotrifluoromethane	A1	—	—	—	1,000	2-0-0 ^b
R-14	CF ₄	tetrafluoromethane (carbon tetrafluoride)	A1	25	110,000	400	1,000	2-0-0 ^b
R-22	CHClF ₂	chlorodifluoromethane	A1	13	59,000	210	1,000	2-0-0 ^b
R-23	CHF ₃	trifluoromethane (fluoroform)	A1	7.3	41,000	120	1,000	2-0-0 ^b
R-30	CH ₂ Cl ₂	dichloromethane (methylene chloride)	B1	—	—	—	—	—
R-32	CH ₂ F ₂	difluoromethane (methylene fluoride)	A2L A2 ^f	4.8	36,000	77	1,000	1-4-0
R-40	CH ₃ Cl	chloromethane (methyl chloride)	B2	—	—	—	—	—
R-50	CH ₄	methane	A3	—	—	—	1,000	—
R-113 ^d	CCl ₂ FCClF ₂	1,1,2-trichloro-1,2,2-trifluoroethane	A1	1.2	2,600	20	1,000	2-0-0 ^b
R-114 ^d	CClF ₂ CClF ₂	1,2-dichloro-1,1,2,2-tetrafluoroethane	A1	8.7	20,000	140	1,000	2-0-0 ^b
R-115	CClF ₂ CF ₃	chloropentafluoroethane	A1	47	120,000	760	1,000	—
R-116	CF ₃ CF ₃	hexafluoroethane	A1	34	97,000	550	1,000	1-0-0
R-123	CHCl ₂ CF ₃	2,2-dichloro-1,1,1-trifluoroethane	B1	3.5	9,100	57	50	2-0-0 ^b
R-124	CHClFCF ₃	2-chloro-1,1,1,2-tetrafluoroethane	A1	3.5	10,000	56	1,000	2-0-0 ^b
R-125	CHF ₂ CF ₃	pentafluoroethane	A1	23	75,000	370	1,000	2-0-0 ^b
R-134a	CH ₂ FCF ₃	1,1,1,2-tetrafluoroethane	A1	13	50,000	210	1,000	2-0-0 ^b
R-141b	CH ₃ CCl ₂ F	1,1-dichloro-1-fluoroethane	—	0.78	2,600	12	500	2-1-0
R-142b	CH ₃ CClF ₂	1-chloro-1, 1-difluoroethane	A2	5.1	20,000	83	1,000	2-4-0
R-143a	CH ₃ CF ₃	1,1,1-trifluoroethane	A2L A2 ^f	4.5	21,000	70	1,000	2-0-0 ^b
R-152a	CH ₃ CHF ₂	1,1-difluoroethane	A2	2.0	12,000	32	1,000	1-4-0
R-170	CH ₃ CH ₃	ethane	A3	0.54	7,000	8.7	1,000	2-4-0
R-E170	CH ₃ OCH ₃	Methoxymethane (dimethyl ether)	A3	1.0	8,500	16	1,000	—
R-218	CF ₃ CF ₂ CF ₃	octafluoropropane	A1	43	90,000	690	1,000	2-0-0 ^b
R-227ea	CF ₃ CHFCF ₃	1,1,1,2,3,3,3-heptafluoropropane	A1	36	84,000	580	1,000	—
R-236fa	CF ₃ CH ₂ CF ₃	1,1,1,3,3,3-hexafluoropropane	A1	21	55,000	340	1,000	2-0-0 ^b
R-245fa	CHF ₂ CH ₂ CF ₃	1,1,1,3,3-pentafluoropropane	B1	12	34,000	190	300	2-0-0 ^b
R-290	CH ₃ CH ₂ CH ₃	propane	A3	0.56	5,300	9.5	1,000	2-4-0
R-C318	-(CF ₂) ₄ -	octafluorocyclobutane	A1	41	80,000	660	1,000	—
R-400 ^d	zeotrope	R-12/114 (50.0/50.0)	A1	10	28,000	160	1,000	2-0-0 ^b
R-400 ^d	zeotrope	R-12/114 (60.0/40.0)	A1	11	30,000	170	1,000	—
R-401A	zeotrope	R-22/152a/124 (53.0/13.0/34.0)	A1	6.6	27,000	110	1,000	2-0-0 ^b
R-401B	zeotrope	R-22/152a/124 (61.0/11.0/28.0)	A1	7.2	30,000	120	1,000	2-0-0 ^b
R-401C	zeotrope	R-22/152a/124 (33.0/15.0/52.0)	A1	5.2	20,000	84	1,000	2-0-0 ^b
R-402A	zeotrope	R-125/290/22 (60.0/2.0/38.0)	A1	17	66,000	270	1,000	2-0-0 ^b
R-402B	zeotrope	R-125/290/22 (38.0/2.0/60.0)	A1	15	63,000	240	1,000	2-0-0 ^b
R-403A	zeotrope	R-290/22/218 (5.0/75.0/20.0)	A2	7.6	33,000	120	1,000	2-0-0 ^b
R-403B	zeotrope	R-290/22/218 (5.0/56.0/39.0)	A1	18	70,000	290	1,000	2-0-0 ^b

R-404A	zeotrope	R-125/143a/134a (44.0/52.0/4.0)	A1	31	130,000	500	1,000	2-0-0 ^b
R-405A	zeotrope	R-22/152a/142b/C318 (45.0/7.0/5.5/2.5)	—	16	57,000	260	1,000	—
R-406A	zeotrope	R-22/600a/142b (55.0/4.0/41.0)	A2	4.7	21,000	25	1,000	—
R-407A	zeotrope	R-32/125/134a (20.0/40.0/40.0)	A1	19	83,000	300	1,000	2-0-0 ^b
R-407B	zeotrope	R-32/125/134a (10.0/70.0/20.0)	A1	21	79,000	330	1,000	2-0-0 ^b
R-407C	zeotrope	R-32/125/134a (23.0/25.0/52.0)	A1	18	81,000	290	1,000	2-0-0 ^b
R-407D	zeotrope	R-32/125/134a (15.0/15.0/70.0)	A1	16	68,000	250	1,000	2-0-0 ^b
R-407E	zeotrope	R-32/125/134a (25.0/15.0/60.0)	A1	17	80,000	280	1,000	2-0-0 ^b
R-407F	zeotrope	R-32/125/134a (30.0/30.0/40.0)	A1	20	95,000	320	1,000	—
R-408A	zeotrope	R-125/143a/22 (7.0/46.0/47.0)	A1	21	95,000	340	1,000	2-0-0 ^b
R-409A	zeotrope	R-22/124/142b (60.0/25.0/15.0)	A1	7.1	29,000	110	1,000	2-0-0 ^b
R-409B	zeotrope	R-22/124/142b (65.0/25.0/10.0)	A1	7.3	30,000	120	1,000	2-0-0 ^b
R-410A	zeotrope	R-32/125 (50.0/50.0)	A1	26	140,000	420	1,000	2-0-0 ^b
R-410B	zeotrope	R-32/125 (45.0/55.0)	A1	27	140,000	430	1,000	2-0-0 ^b
R-411A	zeotrope	R-127/22/152a (1.5/87.5/11.0)	A2	2.9	14,000	46	990	—
R-411B	zeotrope	R-1270/22/152a (3.0/94.0/3.0)	A2	2.8	13,000	45	980	—
R-412A	zeotrope	R-22/218/142b (70.0/5.0/25.0)	A2	5.1	22,000	82	1,000	—
R-413A	zeotrope	R-218/134a/600a (9.0/88.0/3.0)	A2	5.8	22,000	94	1,000	—
R-414A	zeotrope	R-22/124/600a/142b (51.0/28.5/4.0/16.5)	A1	6.4	26,000	100	1,000	—
R-414B	zeotrope	R-22/124/600a/142b (50.0/39.0/1.5/9.5)	A1	6.0	23,000	95	1,000	—
R-415A	zeotrope	R-22/152a (82.0/18.0)	A2	2.9	14,000	47	1,000	—
R-415B	zeotrope	R-22/152a (25.0/75.0)	A2	2.1	12,000	34	1,000	—
R-416A	zeotrope	R-134a/124/600 (59.0/39.5/1.5)	A1	3.9	14,000	62	1,000	2-0-0 ^b
R-417A	zeotrope	R-125/134a/600 (46.6/50.0/3.4)	A1	3.5	13,000	56	1,000	2-0-0 ^b
R-417B	zeotrope	R-125/134a/600 (79.0/18.3/2.7)	A1	4.3	15,000	70	1,000	—
R-417C	zeotrope	R-125/134a/600 (19.5/78.8/1.7)	A1	5.4	21,000	87	1,000	—
R-418A	zeotrope	R-290/22/152a (1.5/96.0/2.5)	A2	4.8	22,000	77	1,000	—
R-419A	zeotrope	R-125/134a/E170 (77.0/19.0/4.0)	A2	4.2	15,000	67	1,000	—
R-419B	zeotrope	R-125/134a/E170 (48.5/48.0/3.5)	A2	4.6	17,000	74	1,000	—
R-420A	zeotrope	R-134a/142b (88.0/12.0)	A1	12	45,000	190	1,000	2-0-0 ^b
R-421A	zeotrope	R-125/134a (58.0/42.0)	A1	17	61,000	280	1,000	2-0-0 ^b
R-421B	zeotrope	R-125/134a (85.0/15.0)	A1	21	69,000	330	1,000	2-0-0 ^b
R-422A	zeotrope	R-125/134a/600a (85.1/11.5/3.4)	A1	18	63,000	290	1,000	2-0-0 ^b
R-422B	zeotrope	R-125/134a/600a (55.0/42.0/3.0)	A1	16	56,000	250	1,000	2-0-0 ^b
R-422C	zeotrope	R-125/134a/600a (82.0/15.0/3.0)	A1	18	62,000	290	1,000	2-0-0 ^b
R-422D	zeotrope	R-125/134a/600a (65.1/31.5/3.4)	A1	16	58,000	260	1,000	2-0-0 ^b
R-422E	zeotrope	R-125/134a/600a (58.0/39.3/2.7)	A1	16	57,000	260	1,000	—
R-423A	zeotrope	R-134a/227ea (52.5/47.5)	A1	19	59,000	310	1,000	2-0-0 ^c
R-424A	zeotrope	R-125/134a/600a/600/601a (50.5/47.0/0.9/1.0/0.6)	A1	6.2	23,000	100	970	2-0-0 ^b
R-425A	zoetrope	R-32/134a/227ea (18.5/69.5/12.0)	A1	16	72,000	260	1,000	2-0-0 ^b
R-426A	zeotrope	R-125/134a/600a/601a (5.1/93.0/1.3/0.6)	A1	5.2	20,000	83	990	—

R-427A	zeotrope	R-32/125/143a/134a (15.0/25.0/10.0/50.0)	A1	18	79,000	290	1,000	2-1-0
R-428A	zeotrope	R-125/143a/290/600a (77.5/20.0/0.6/1.9)	A1	23	83,000	370	1,000	—
R-429A	zeotrope	R-E170/152a/600a (60.0/10.0/30.0)	A3	0.81	6,300	13	1,000	—
R-430A	zeotrope	R-152a/600a (76.0/24.0)	A3	1.3	8,000	21	1,000	—
R-431A	zeotrope	R-290/152a (71.0/29.0)	A3	0.69	5,500	11	1,000	—
R-432A	zeotrope	R-1270/E170 (80.0/20.0)	A3	0.13	1,200	2.1	700	—
R-433A	zeotrope	R-1270/290 (30.0/70.0)	A3	0.34	3,100	5.5	880	—
R-433B	zeotrope	R-1270/290 (5.0-95.0)	A3	0.51	4,500	8.1	950	—
R-433C	zeotrope	R-1270/290 (25.0-75.0)	A3	0.41	3,600	6.6	790	—
R-434A	zeotrope	R-125/143a/600a (63.2/18.0/16.0/2.8)	A1	20	73,000	320	1,000	—
R-435A	zeotrope	R-E170/152a (80.0/20.0)	A3	1.1	8,500	17	1,000	—
R-436A	zeotrope	R-290/600a (56.0/44.0)	A3	0.50	4,000	8.1	1,000	—
R-436B	zeotrope	R-290/600a (52.0/48.0)	A3	0.51	4,000	8.1	1,000	—
R-437A	zeotrope	R-125/134a/600/601 (19.5/78.5/1.4/0.6)	A1	5.0	19,000	82	990	—
R-438A	zeotrope	R-32/125/134a/600/601a (8.5/45.0/44.2/1.7/0.6)	A1	4.9	20,000	79	990	—
R-439A	zeotrope	R-32/125/600a (50.0/47.0/3.0)	A2	4.7	26,000	76	990	—
R-440A	zeotrope	R-290/134a/152a (0.6/1.6/97.8)	A2	1.9	12,000	31	1,000	—
R-441A	zeotrope	R-170/290/600a/600 (3.1/54.8/6.0/36.1)	A3	0.39	3,200	6.3	1,000	—
R-442A	zeotrope	R-32/125/134a/152a/227ea (31.0/31.0/30.0/3.0/5.0)	A1	21	100,000	330	1,000	—
R-443A	zeotrope	R-1270/290/600a (55.0/40.0/5.0)	A3	0.19	1,700	3.1	580	—
R-444A	zeotrope	R-32/152a/1234ze(E) (12.0/5.0/83.0)	A2L A2 ^f	5.1	21,000	81	850	—
R-444B	zeotrope	R-32/152a/1234ze(E) (41.5/10.0/48.5)	A2L A2 ^f	4.3	23,000	69	890	—
R-445A	zeotrope	R-744/134a/1234ze(E) (6.0/9.0/85.0)	A2L A2 ^f	4.2	16,000	67	930	—
R-446A	zeotrope	R-32/1234ze(E)/600 (68.0/29.0/3.0)	A2L A2 ^f	2.5	16,000	39	960	—
R-447A	zeotrope	R-32/125/1234ze(E) (68.0/3.5/28.5)	A2L A2 ^f	2.6	16,000	42	900	—
R-448A	zeotrope	R-32/125/1234yf/134a/1234ze(E) (26.0/26.0/20.0/21.0/7.0)	A1	24	110,000	390	890	—
R-449A	zeotrope	R-32/125/1234yf/134a (24.3/24.7/25.3/25.7)	A1	23	100,000	370	830	—
R-450A	zeotrope	R-134a/1234ze(E) (42.0/58.0)	A1	20	72,000	320	880	—
R-451A	zeotrope	R-1234yf/134a (89.8/10.2)	A2L A2 ^f	5.3	18,000	81	520	—
R-451B	zeotrope	R-1234yf/134a (88.8/11.2)	A2L A2 ^f	5.3	18,000	81	530	—
R-452A	zeotrope	R-32/125/1234yf (11.0/59.0/30.0)	A1	27	100,000	440	780	—
R-500 ^e	azeotrope	R-12/152a (73.8/26.2)	A1	7.6	30,000	120	1,000	2-0-0 ^b
R-501 ^d	azeotrope	R-22/12 (75.0/25.0)	A1	13	54,000	210	1,000	—
R-502 ^c	azeotrope	R-22/115 (48.8/51.2)	A1	21	73,000	330	1,000	2-0-0 ^b
R-503 ^c	azeotrope	R-23/13 (40.1/59.9)	—	—	—	—	1,000	2-0-0 ^b
R-504 ^d	azeotrope	R-32/115 (48.2/51.8)	—	28	140,000	450	1,000	—
R-507A	azeotrope	R-125/143a (50.0/50.0)	A1	32	130,000	520	1,000	2-0-0 ^b
R-508A	azeotrope	R-23/116 (39.0/61.0)	A1	14	55,000	220	1,000	2-0-0 ^b
R-508B	azeotrope	R-23/116 (46.0/54.0)	A1	13	52,000	200	1,000	2-0-0 ^b
R-509A	azeotrope	R-22/218 (44.0/56.0)	A1	24	75,000	390	1,000	2-0-0 ^b
R-510A	azeotrope	R-E170/600a (88.0/12.0)	A3	0.87	7,300	14	1,000	—
R-511A	azeotrope	R-290/E170 (95.0/5.0)	A3	0.59	5,300	9.5	1,000	—
R-512A	azeotrope	R-134a/152a (5.0/95.0)	A2	1.9	11,000	31	1,000	—
R-513A	azeotrope	R-1234yf/134a (56.0/44.0)	A1	20	72,000	320	650	—
R-600	CH ₃ CH ₂ CH ₂ CH ₃	butane	A3	0.15	1,000	2.4	1,000	1-4-0
R-600a	CH(CH ₃) ₂ CH ₃	2-methylpropane (isobutane)	A3	0.59	4,000	9.6	1,000	2-4-0

R-601	CH ₃ CH ₂ CH ₂ CH ₂ CH ₃	pentane	A3	0.18	1,000	2.9	600	—
R-601a	(CH ₃) ₂ CHCH ₂ CH ₃	2-methylbutane (isopentane)	A3	0.18	1,000	2.9	600	—
R-610	ethoxyethane (ethyl ether)	CH ₃ CH ₂ OCH ₂ CH ₃	—	—	—	—	400	—
R-611	methyl formate	HCOOCH ₃	B2	—	—	—	100	—
R-717	NH ₃	ammonia	B2L B2 ^f	0.014	320	0.22	25	3-3-0 ^c
R-718	H ₂ O	water	A1	—	—	—	—	0-0-0
R-744	CO ₂	carbon dioxide	A1	4.5	40,000	72	5,000	2-0-0 ^b
R-1150	CH ₂ =CH ₂	ethene (ethylene)	A3	—	—	—	200	1-4-2
R-1233zd(E)	CF ₃ CH=CHCl	trans-1-chloro-3,3,3-trifluoro-1-propene	A1	5.3	16,000	85	800	—
R-1234yf	CF ₃ CF=CH ₂	2,3,3,3-tetrafluoro-1 propene	A2L A2 ^f	4.7	16,000	75	500	—
R-1234ze(E)	CF ₃ CH=CHF	trans-1,3,3,3-tetrafluoro-1 -propene	A2L A2 ^f	4.7	16,000	75	800	—
R-1270	CH ₃ CH=CH ₂	Propene (propylene)	A3	0.1	1,000	1.7	500	1-4-1

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.0283m³

- a. Degrees of hazard are for health, fire, and reactivity, respectively, in accordance with NFPA 704.
- b. Reduction to 1-0-0 is allowed if analysis satisfactory to the code official shows that the maximum concentration for a rupture or full loss of refrigerant charge would not exceed the IDLH, considering both the refrigerant quantity and room volume.
- c. For installations that are entirely outdoors, use 3-1-0.
- d. Class I ozone depleting substance; prohibited for new installations.
- e. Occupational Exposure Limit based on the OSHA PEL, ACGIH TLV-TWA, the TERA WEEL or consistent value on a time-weighted average (TWA) basis (unless noted C for ceiling) for an 8 hr/d and 40 hr/wk.
- f. ~~The ASHRAE Standard 34 flammability classification for this refrigerant is 2L, which is a subclass of Class 2.~~

1106.4 Flammable refrigerants. Where refrigerants of Groups A2L, A2, A3, B2L, B2 and B3 are used in one or more refrigerating systems, the *machinery room* shall conform to the Class 1, 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.
2. ~~*Machinery rooms* for systems containing in which the refrigerating system(s) that contain(s) flammable refrigerants utilize only Group A2L refrigerants that refrigerant(s), and are in accordance with Section 1106.5.~~

1106.5.2 Emergency ventilation system. An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE ~~15 or Table 1106.5.2-15~~. Shutdown of the emergency ventilation system shall be by manual means.

Delete without substitution:

**TABLE 1106.5.2
MINIMUM EXHAUST RATES**

REFRIGERANT	Q(m/sec)	Q(cfm)
R32	15.4	32,600
R143	13.6	28,700
R444A	6.46	13,700
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

Reason:

The proposed code changes include technical content based on ASHRAE Standard 34-2016 with Addendum G and ASHRAE Standard 15-2016 with Addendum H. The revisions in these two ASHRAE addenda are dependent and must be correlated as shown in this code change proposal. Upon publication, these addenda will be incorporated into the 2019 editions of ASHRAE 34 and ASHRAE 15.

There was a considerable amount of industry research into the use of flammable refrigerants that occurred in 2016 and 2017, following the announcement in June 2016 of a collaborative research effort between ASHRAE, AHRI, and US DOE. ASHRAE SSPC15 relied upon this body of knowledge, extended upon prior ASHRAE research from 2012, in drafting the addenda to the 2016 edition of Standard 15.

The refrigerant safety group classification is an alphabetical/numerical designation that is used to identify both the toxicity and flammability classifications of a given refrigerant. There are two new safety group classifications added to ASHRAE 34: A2L and B2L. Previously 2L was a sub-class of class 2 as an interim measure to implement changes to refrigerant flammability classification into ASHRAE 34 prior to making associated changes to a future edition of ASHRAE 15; but now 2L is a separate class and safety requirements must be revised to distinguish between class 2 and class 2L.

The current definitions of “flammability classification” and “toxicity classification” are improper since both contain mandatory code requirements. The definitions should only define the term, not contain code requirements with the use of the word “shall.” The current definition of refrigerant safety classifications is incorrect due to revisions to ASHRAE 34. The attempt to define the technical requirements of flammability are not correct. ASHRAE 34 goes into extensive requirements as to how to test and classify a refrigerant regarding flammability. The code should leave the technical requirements to ASHRAE 34 which is accomplished in Section 1103.1. The definition only has to identify the meanings of the classification categories. These terms used are found in the body of ASHRAE 34. The addition of “refrigerant” to the term “flammability classification” and “toxicity classification” clarify that the definitions only apply to refrigerants. Flammability and toxicity are terms also used in the ventilation sections of the code. These definitions do not apply to the use of those terms in Chapter 5.

Bibliography:

(AHRI) Final Report - AHRI 8005 "Risk Assessment of Class 2L Refrigerants in Chiller Systems", prepared by Bill Goetzler, Matt Guernsey, & Collin Weber (July 2013).

<http://www.ahrinet.org/Resources/Research.aspx>

(ASHRAE 2012) ASHRAE Research Project TRP-1448, "Final Report: Ventilation Requirements for Refrigerating Machinery Rooms", July 2012.

(ASHRAE 2016a) ASHRAE Standard 15-2016 "Safety Standard for Refrigeration Systems" (2016).

(ASHRAE 2016b) ASHRAE Standard 34-2016 "Designation and Safety Classification of Refrigerants" (2016).

(Papas et. al. 2016) Paul Papas, Shiling Zhang, Hai Jiang, Parmesh Verma, Ivan Rydkin, Richard Lord & Larry Burns (2016) Computational fluid dynamics modeling of flammable refrigerant leaks inside machine rooms: Evaluation of ventilation mitigation requirements, Science and Technology for the Built Environment, 22:4, 463-471, DOI:10.1080/23744731.2016.1163240

Cost Impact

The code change proposal will not increase or decrease the cost of construction .

This code change proposal addresses a new safety group of refrigerants, with no precedent on the construction costs.

Internal ID: 3460

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Should not remove the exhaust rate table and rely solely on the standards. (Vote 11-0)

Assembly Action:

None

F79-18 Part II

Individual Consideration Agenda

Public Comment 1:

Proponent: Connor Barbaree, representing ASHRAE (cbarbaree@ashrae.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

605.16 Electrical equipment. Where *refrigerant* of Groups A2L, A2, A3, B2L other than ammonia, 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 or B2L refrigerants that are provided with ~~ventilation~~ refrigerant detection in accordance with Section 605.17, ~~or Group B2L refrigerants that are provided with 8~~ and ventilation in accordance with ~~Sections~~ Section 605.12.3-13 and Section 1106.3-5 of the International Mechanical Code.

~~**605.17 Special requirements for Group A2L refrigerant machinery rooms.** Machinery rooms with systems containing Group A2L refrigerants shall comply with Section 1106.4 of the International Mechanical Code.~~

~~**Exception:** Machinery rooms conforming to the Class 1, Division 2 hazardous location classification requirements of NFPA 70.~~

2018 International Mechanical Code

SECTION 1106 MACHINERY ROOM, SPECIAL REQUIREMENTS

1106.4 Flammable refrigerants. Where refrigerants of Groups A2L, A2, A3, B2L other than ammonia, B2 and B3 are used in one or more refrigerating systems, the *machinery room* shall conform to the Class 1, Division 2, *hazardous location* classification requirements of NFPA 70.

~~Exceptions~~ **Exception:** ~~1. Ammonia machinery rooms that are provided with ventilation in accordance with Section 1106.3. 2. Machinery rooms in which the refrigerating system(s) that contain(s) flammable refrigerants utilize only Group A2L refrigerant(s) or Group B2L refrigerant(s) other than ammonia, and are in accordance with comply with the ventilation requirements of Section 1106.5.2.~~

1106.5 Special requirements for Group A2L and B2L refrigerant machinery rooms. *Machinery rooms* for systems containing Group A2L or Group B2L refrigerants other than ammonia shall comply with Sections 1106.5.1 through 1106.5.3.

Exception: *Machinery rooms* conforming to the Class I, Division 2, hazardous location classification requirements of NFPA 70 are not required to comply with Sections 1106.5.1 and 1106.5.2.

~~**1106.5.2 Emergency ventilation system.** An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15. Shutdown of the emergency ventilation system shall be by manual means.~~

1106.5.2 Ventilation required. *Machinery rooms* shall be vented to the outdoors, utilizing ventilation in accordance with Sections 1106.5.3 through 1106.5.8 or ASHRAE 15.

1106.5.3 Alarms. Alarms shall comply with Sections 1106.5.3.1 through 1106.5.3.4.

1106.5.3.1 Annunciation. The alarm shall have visual and audible annunciation inside the *machinery room* and outside each entrance to the *machinery room*.

1106.5.3.2 Set point. The refrigerant detector set points shall activate an alarm in accordance with the type of reset in Table 1106.5.3.2. Manual reset type alarms shall have the reset mechanism located inside the *machinery room*.

**TABLE 1106.5.3.2
VENTILATION FOR GROUP A2L AND B2L REFRIGERANTS OTHER THAN AMMONIA**

Limit Value	Response Time (seconds)	Alarm Type	Alarm Reset Type	Ventilation Rate	Ventilation Reset Type
Set Point ≤ OEL	≤ 300	Trouble Alarm	Automatic	Level 1	Automatic
Set Point ≤ RCL	≤ 15	Emergency Alarm	Manual	Level 2	Manual

1106.5.3.3 Optional setting. Alarms set at levels other than indicated in Table 1106.5.3.2, such as IDLH, and automatic reset alarms are permitted in addition to those required by Section 1106.5.3. The meaning of each alarm shall be clearly marked by signage near the annunciators.

1106.5.3.4 Trouble alarm. In the event of a failure during a refrigerant detector self-test, a trouble alarm signal shall be transmitted to an approved monitored location.

1106.5.4 Mechanical ventilation. Mechanical ventilation shall be in accordance with all of the following:

1. One or more power-driven fans capable of exhausting air from the *machinery room* shall be provided. Multispeed fans shall be permitted.
2. Electric motors driving fans shall not be placed inside ducts. Fan rotating elements shall be nonferrous or nonsparking, or the casing shall consist of or be lined with such material.
3. Supply make-up air to replace that being exhausted shall be provided. Ducts for supply to and exhaust from the *machinery room* shall serve no other area. Makeup air supply outlet locations shall be positioned relative to the exhaust air inlet location(s) to prevent short-circuiting.
4. Inlets to the exhaust ducts shall be located in an area where refrigerant from a leak will concentrate, with consideration given to the location of the makeup air supply paths and refrigerating machines, and the density of the refrigerant relative to air.
5. Inlets to exhaust ducts shall be within 1 ft (0.3 m) of the lowest point of the *machinery room* for refrigerants that are heavier than air, and shall be within 1 ft (0.3 m) of the highest point for refrigerants that are lighter than air.
6. The discharge of the exhaust air shall be to the outdoors in such a manner as not to cause a nuisance or danger.

1106.5.5 Level 1 Ventilation. The refrigerating machinery room mechanical ventilation required by Section 1106.5.4 shall exhaust at an airflow rate not less than shown in Table 1106.5.5. Ventilation reset shall be in accordance with the type of reset in Table 1106.5.3.2. Automatic reset shall not deactivate the ventilation system until after the refrigerant concentration has been reduced below the OEL and maintained below the OEL for not less than 5 minutes.

**TABLE 1106.5.5
Level 1 Ventilation Rate for Class A2L Refrigerants**

Status	Airflow
<u>Operated when occupied, and</u> <u>Operated when activated in accordance with Section 1106.5.2 and Table 1106.5.3.2</u>	The greater of: (a) 0.5 ft ³ /min per ft ² (2.54 L/s per m ²) of <i>machinery room</i> area, <u>or</u> (b) 20 ft ³ /min (9.44 L/s) per person
<u>Operable when occupied</u>	With or without mechanical cooling of the <i>machinery room</i> , the greater of: (a) <u>the airflow rate required to not exceed a temperature rise of 18°F (10°C) above inlet air temperature, or</u> (b) <u>the airflow rate required to not exceed a maximum air temperature of 122°F (50°C) in the <i>machinery room</i></u>

1106.5.6 Level 2 Ventilation. A part of the *machinery room* mechanical ventilation referred to in Section 1106.5.4 shall exhaust an accumulation of refrigerant resulting from leaks or a rupture of a refrigerating system or portion thereof in the *machinery room*. The refrigerant detector(s) shall activate ventilation at a set point and response time in accordance with Table 1106.5.3.2, and at an airflow rate not less than the value determined in accordance with Section 1106.5.7. Where multiple refrigerant designations are in the *machinery room*, the required airflow shall be evaluated according to each refrigerating system and the highest airflow rate shall apply.

Ventilation reset shall be in accordance with the type of reset in Table 1106.5.3.2. Manual type ventilation reset shall have the reset mechanism located inside the *machinery room*.

1106.5.7 Group A2L ventilation rate. Where required by Section 1106.5.6, the total airflow for Level 2 Ventilation shall be not less than the airflow rate determined by Figure 1106.5.7.

~~1106.5.3~~**1106.5.8 Emergency ventilation system discharge.** The emergency ventilation system 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*.

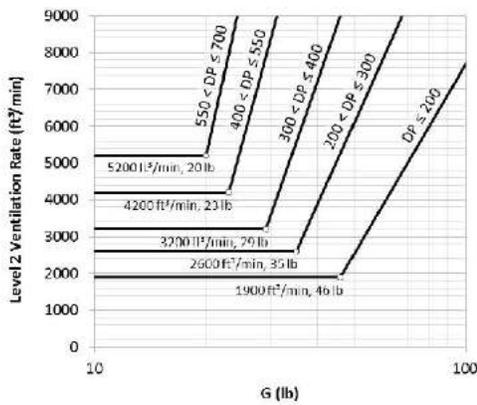
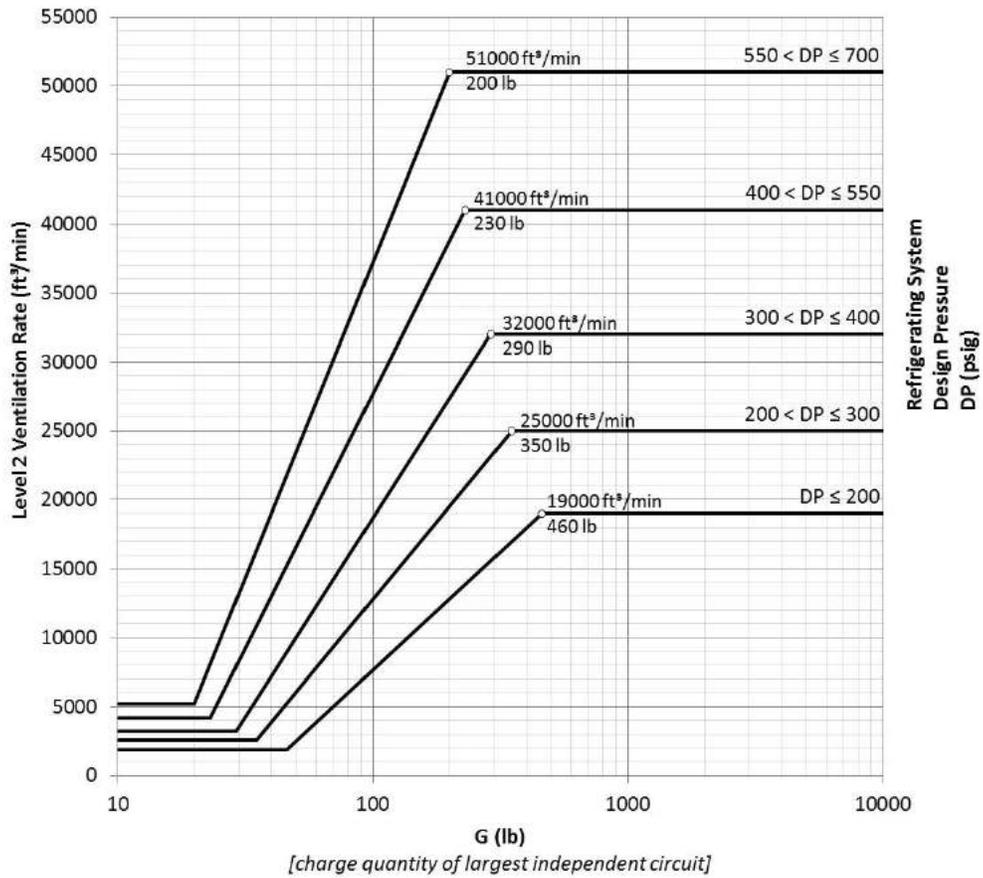


FIGURE 1106.5.7 (I-P)
Level 2 Ventilation Rate for Group A2L Refrigerants

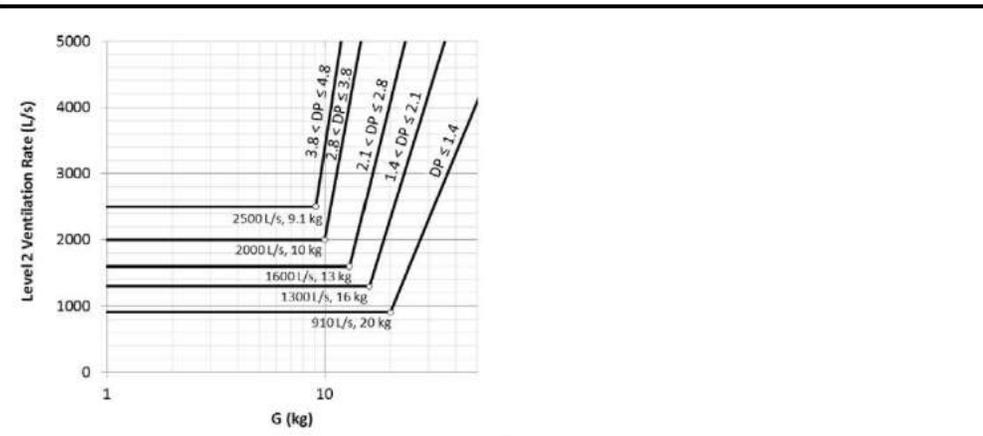
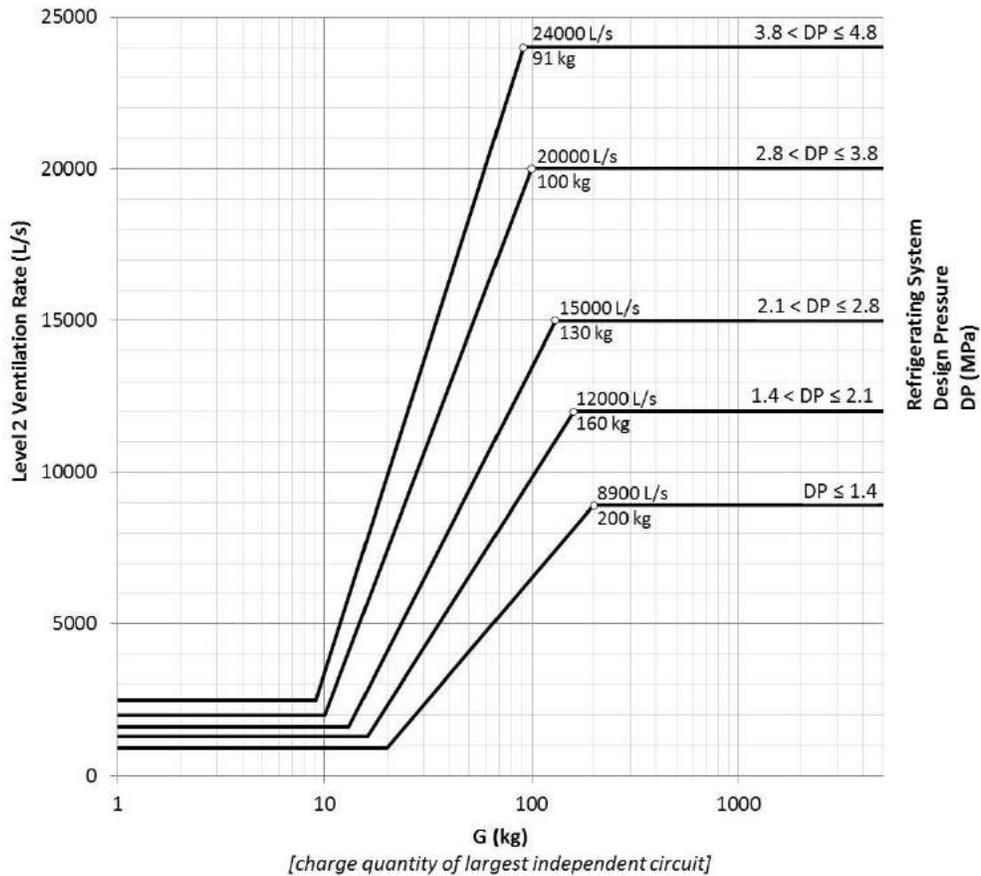


FIGURE 1106.5.7 (SI)
Level 2 Ventilation Rate for Group A2L Refrigerants

Commenter's Reason: When the ventilation table was added to the 2018 Code, it was based on an initial Advisory Public Review (APR) published by ASHRAE. When the SSPC 15 (ASHRAE 15 Committee) had reviewed all of the comments, they issue a Publication Public Review (PPR). Through multiple PPRs, the ventilation requirements significantly changed. These modifications are based on the results of input from public comments.

The proposed modification will add new ventilation requirements to the code consistent with what will appear in ASHRAE 15. The ventilation requirements are based on the size of the refrigerant charge and the pressure of the refrigerant system. There are two levels of ventilation required. The first level, identified as Level 1, is based on a minor leak in the refrigerant system. Level 1 ventilation also requires the signaling of a trouble alarm.

Since Level 1 Ventilation is based on a minor leak, the alarm is permitted to automatically reset. This allows normal operation in the event of a nuisance alarm.

When there is a significant leak of the refrigerant, Level 2 ventilation is automatically activated. Level 2 ventilation is required when the refrigerant detector reaches a concentration of refrigerant that is at or above the RCL which is 25 percent of the lower flammable limit for A2L refrigerants. The ventilation rate is determined by the value shown on the charts, based on charge size and system pressure. Once Level 2 ventilation is activated, an emergency signal is activated and the alarms (detector) must be manually reset.

The two levels of ventilation are a better method of providing the necessary safety in a machinery room. This prevents a dangerous level of refrigerant from accumulating in the event of a leak.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

This change clarifies the requirements for ventilation of a machinery room. The use of A2L refrigerant is optional.

F79-18 Part II

F81-18

IFC: 605.12.2, 605.12.2.1, 605.12.4

Proposed Change as Submitted

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (JBEngineer@aol.com)

2018 International Fire Code

Revise as follows

605.12.2 Flammable refrigerants. Systems containing more than 6.6 pounds (3 kg) of ~~flammable Group A2, A3, B2, or B3~~ refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section 605.12.5 or a flaring system in accordance with Section 605.12.6. Systems containing more than 6.6 pounds (3 kg) of ~~flammable Group A2, A3, B2, or B3~~ refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is 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*.

Add new text as follows

605.12.2.1 Group A2L refrigerant. Systems containing more than 6.6 pounds (3 kg) of Group A2L refrigerant shall discharge vapor directly to atmosphere where the fire code official determines, on review of an engineering analysis prepared in accordance with Section 104.7.2, that a fire hazard would not result from atmospheric discharge of Group A2L refrigerant.

Revise as follows

605.12.4 Ammonia and Group B2L refrigerant. Systems containing more than 6.6 pounds (3 kg) of ammonia or Group B2L refrigerant shall discharge vapor to the atmosphere in accordance with one of the following methods:

1. Directly to atmosphere where the *fire code official* determines, on review of an engineering analysis prepared in accordance with Section 104.7.2, that a fire, health or environmental hazard would not result from atmospheric discharge of ammonia or B2L refrigerant.
2. Through an *approved* treatment system in accordance with Section 605.12.5.
3. Through a flaring system in accordance with Section 605.12.6.
4. ~~Through~~ For ammonia, through an *approved* ammonia diffusion system in accordance with Section 605.12.7.
5. By other *approved* means.

Exception: Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.

Reason: ASHRAE 34 changed the grouping of refrigerants adding two new categories, A2L and B2L. These refrigerants are lower flammable refrigerants. The refrigerants do not readily ignite and do not pose the same hazard as A2, A3, B2, and B3 refrigerants. With the addition of these new refrigerants, revisions are necessary to these section. Ammonia is a Group B2L refrigerant, hence, there are already special requirements. The modification will allow other B2L refrigerants to meet the same requirements.

A2L refrigerants have similar flammability characteristics to ammonia. Hence, allowance for the evaluation of ignition should apply similar to ammonia. The text in Section 606.12.3.1 is similar to item 1 in Section 606.12.5. Item 1 of Section 606.12.5 also includes an evaluation of the health or environmental hazard which would not apply to A2L refrigerants.

Cost Impact: The code change proposal will decrease the cost of construction Group A2L refrigerants will be treated similar to ammonia regarding the flammability.

F81-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon the action taken on F79-18 Part I which also deals with A2L refrigerants. This may be a viable option but more information is needed. (Vote: 14-0)

Assembly Action:

None

F81-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Daikin US (JBEngineer@aol.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

605.12.2 Flammable refrigerants. Systems containing more than 6.6 pounds (3 kg) of Group A2, A3, B2, or B3 refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an *approved* treatment system in accordance with Section 605.12.5 or a flaring system in accordance with Section 605.12.6. Systems containing more than 6.6 pounds (3 kg) of Group A2, A3, B2, or B3 refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is 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*.

605.12.2.1 Group A2L refrigerant. Systems containing more than 6.6 pounds (3 kg) of Group A2L refrigerant shall discharge vapor directly to atmosphere where the fire code official determines, on review of an ~~engineering~~ analysis prepared in accordance with Section 104.7.2, that a fire hazard would not result from atmospheric discharge of Group A2L refrigerant.

605.12.4 Ammonia and Group B2L refrigerant. Systems containing more than 6.6 pounds (3 kg) of ammonia or Group B2L refrigerant shall discharge vapor to the atmosphere in accordance with one of the following methods:

1. Directly to atmosphere where the *fire code official* determines, on review of an engineering analysis prepared in accordance with Section 104.7.2, that a fire, health or environmental hazard would not result from atmospheric discharge of ammonia or B2L refrigerant.
2. Through an *approved* treatment system in accordance with Section 605.12.5.
3. Through a flaring system in accordance with Section 605.12.6.
4. For ammonia, through an *approved* ammonia diffusion system in accordance with Section 605.12.7.
5. By other *approved* means.

Exception: Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.

Commenter's Reason: This is a companion change to F79-18. The Committee response is not accurate in that F79-18 does not address the discharge of Group A2L or B2L refrigerants. These two class of refrigerants have the flammability properties similar to ammonia, which is a B2L refrigerant. Hence, a separate section is needed to regulate the refrigerants. The requirements for the remaining flammable refrigerants that fall into Group A2, A3, B2, and B3 do not change. The only new requirements are for A2L refrigerants. Engineering was removed as a prefix to analysis since the term is unnecessary with a reference to Section 104.7.2. This will avoid possible confusion.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. The discharge of A2L and B2L refrigerants will be properly addressed. The newer discharge requirements are less expensive to install.

F81-18

F84-18

IFC: 606.1, 606.2, 606.3, 606.3.1, 606.3.2, 606.3.3, 606.3.4, 606.4, 606.5, 606.5.1, 606.5.2, 606.5.3, 606.6, 606.6.1, 606.6.2, 606.6.2.1, 606.6.2.2, 606.6.2.3, 606.6.2.4

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Add new text as follows

606.1 General. Elevators and conveying systems required by this code or the International Building Code shall comply with Chapter 30 of the International Building Code and Sections 606.2 through 606.6

Revise as follows

~~606.1~~**606.2 Emergency operation.** Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements in Chapter 11-of this code. New elevators shall be provided with Phase I emergency recall operation and Phase II emergency in-car operation in accordance with ASME A17.1/CSA B44.

~~606.2~~**606.3 Standby power.** In buildings and structures where standby power is required or furnished to operate an elevator, standby power shall be provided in accordance with Section 1203-of this code. Operation of the system shall be in accordance with Sections ~~606.2.1~~606.3.1 through ~~606.2.4~~ 606.3.4.

~~606.2.1~~**606.3.1 Manual transfer.** Standby power shall be manually transferable to all elevators in each bank.

~~606.2.2~~**606.3.2 One elevator.** Where only one elevator is installed, the elevator shall automatically transfer to standby power within 60 seconds after failure of normal power.

~~606.2.3~~**606.3.3 Two or more elevators.** Where two or more elevators are controlled by a common operating system, all elevators shall automatically transfer to standby power within 60 seconds after failure of normal power where the standby power source is of sufficient capacity to operate all elevators at the same time. Where the standby power source is not of sufficient capacity to operate all elevators at the same time, all elevators shall transfer to standby power in sequence, return to the designated landing and disconnect from the standby power source. After all elevators have been returned to the designated level, not less than one elevator shall remain operable from the standby power source.

~~606.2.4~~**606.3.4 Machine room ventilation.** Where standby power is connected to elevators, the machine room ventilation or air conditioning shall be connected to the standby power source.

~~[BE] 606.3~~**606.4 Emergency signs.** An *approved* pictorial sign of a standardized design shall be posted adjacent to each elevator call station on all floors instructing occupants to use the exit stairways and not to use the elevators in case of fire. The sign shall read: IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRS.

Exceptions:

1. The emergency sign shall not be required for elevators that are part of an accessible *means of egress* complying with Section 1009.4.
2. The emergency sign shall not be required for elevators that are used for occupant self-evacuation in accordance with Section 3008 of the International Building Code.

Add new text as follows

606.5 Maintenance of elevators. Elevator features and lobbies required by Section 3006 of the International Building Code shall be maintained and in accordance with Sections 606.5.1 thru 606.5.3

Revise as follows

~~606.4~~**606.5.1 Fire service access elevator-elevators and lobbies.** Where fire service access elevators are required by Section 3007 of the International Building Code, the fire service access elevator fire protection and safety features required by Section 3007 of the International Building Code shall be maintained and lobbies shall be maintained free of storage and furniture.

~~606.5~~**606.5.2 Occupant evacuation elevator elevators and lobbies.** Where occupant evacuation elevators are provided in accordance with Section 3008 of the International Building Code, the occupant evacuation elevator fire protection and safety features and lobbies required by Section 3008 of the International Building Code shall be maintained free of storage and furniture.

~~606.6~~**606.5.3 Water protection of hoistway enclosures.** Methods to prevent water from infiltrating into a hoistway enclosure required by Section 3007.3 and Section 3008.3 of the International Building Code shall be maintained.

Add new text as follows

606.6 Elevator keys. All elevators shall be provided with elevator car door and fire-fighter service keys in accordance with Sections 606.6.1 thru 606.6.2.4

Revise as follows

~~606.7~~**606.6.1 Elevator key location.** Keys for the elevator car doors and fire-fighter service keys shall be kept in an *approved* location for immediate use by the fire department.

~~606.8~~**606.6.2 Standardized fire service elevator keys.** Buildings with elevators equipped with Phase I emergency recall, Phase II emergency in-car operation, or a fire service access elevator shall be equipped to operate with a standardized fire service elevator key approved by the *fire code official*.

Exception: The owner shall be permitted to place the building's nonstandardized fire service elevator keys in a key box installed in accordance with Section 506.1.2.

~~606.8.1~~**606.6.2.1 Requirements for standardized fire service elevator keys.** Standardized fire service elevator keys shall comply with all of the following:

1. All fire service elevator keys within the jurisdiction shall be uniform and specific for the jurisdiction. Keys shall be cut to a uniform key code.
2. Fire service elevator keys shall be of a patent-protected design to prevent unauthorized duplication.
3. Fire service elevator keys shall be factory restricted by the manufacturer to prevent the unauthorized distribution of key blanks. Uncut key blanks shall not be permitted to leave the factory.
4. Fire service elevator keys subject to these rules shall be engraved with the words "~~DO~~ DO NOT DUPLICATE."

~~606.8.2~~**606.6.2.2 Access to standardized fire service keys.** Access to standardized fire service elevator keys shall be restricted to the following:

1. Elevator owners or their authorized agents.
2. Elevator contractors.
3. Elevator inspectors of the jurisdiction.
4. *Fire code officials* of the jurisdiction.
5. The fire department and other emergency response agencies designated by the *fire code official*.

~~606.8.3~~**606.6.2.3 Duplication or distribution of keys.** A person shall not duplicate a standardized fire service elevator key or issue, give, or sell a duplicated key unless in accordance with this code.

~~606.8.4~~**606.6.2.4 Responsibility to provide keys.** The building owner shall provide up to three standardized fire service elevator keys where required by the *fire code official*, upon installation of a standardized fire service key switch or switches in the building.

Reason: This is one of 17 proposals being submitted as a package relating to technical and organizational changes proposed for Chapter 6. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

The new scoping section for elevators correlates Section 606 with Chapter 30 of the International Building Code. Clarity is provided regarding the maintenance of not only the elevator lobbies, but also the fire protection and safety features of the elevator. Clarity is also provided in grouping together the sections for maintenance of elevators and lobbies (the new Section 606.5) and the sections for elevator keys (the new Section 606.6)

It is the intention of F-CAC that this proposal correlate with the B-CAC Proposal being heard by the IBC-E Technical Committee to match the elevator signage requirements for standard and occupant evacuation elevators in both IBC

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal clarifies already existing requirements.

Public Hearing Results

Errata: 606.5.2 Occupant evacuation elevators and lobbies. Where occupant evacuation elevators are provided in accordance with Section 3008 of the International Building Code, the occupant evacuation elevator fire protection and safety features and lobbies required by Section 3008 of the International Building Code shall be maintained ~~and maintained~~ free of storage and furniture.

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as the IFC does not require elevators and does not address conveying systems. It was also suggested that Section 606.1 be clarified that Sections 606.2 through 606.6 are sections within the IFC not IBC. (Vote: 14-0)

Assembly Action:

None

F84-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

606.1 General. ~~Elevators~~ Where elevators and conveying systems ~~required by this code or the International Building Code are installed, they~~ shall comply with Chapter 30 of the International Building Code and Sections 606.2 through 606.6 of this code.

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The modification by this Public Comment addresses the Technical Committee reason for Disapproval. The original proposal is part of a package of Chapter 6 reorganization proposals; this proposal is necessary to coordinate the new section numbers with the other Chapter 6 proposal that were AS or AM by the Technical Committee,

Although the Fire Code requires elevators for accessibility in Section 1009.2.1, the requirements in Chapter 30 of the Building Code and Section 606 of the Fire Code should be enforced, whether elevators are required to be installed or not.

Clarification is proposed to the scoping section of Section 606 to clarify the application of the requirements of Section 606 of the Fire Code and Chapter 30 of the Building Code.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal clarifies already existing requirements.

F84-18

F85-18

IFC: 606.6

Proposed Change as Submitted

Proponent: Adria Reinertson, Riverside County Fire Department, representing Riverside County Fire Department, California Fire Chiefs Association (adriar@moval.org)

2018 International Fire Code

Add new text as follows

606.6 Storage within elevator lobbies. Where hoistway opening protection is required by Section 3006.2 of the International Building code, elevator lobbies shall be maintained free of storage.

Reason: There are existing provisions to prohibit storage of furniture and combustibles in fire service and occupant evacuation elevators. This proposal addresses combustible storage in other elevator lobbies requiring hoistway protection.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal clarifies that storage is not permitted in any protected hoistway and does not have an impact on construction costs.

F85-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as determining what is considered storage as often these spaces will contain furniture. (Vote: 13-1)

Assembly Action:

None

F85-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Adria Reinertson, representing Riverside County Fire Department, California Fire Chiefs Association (adriar@moval.org)requests As Submitted.

Commenter's Reason:

Section 3006.2 of the International Building Code requires hoistway protection in accordance with IBC Section 3006.3 if a building meets certain criteria, i.e. height, occupancy or lack of fire protection. Two of the methods to protect the hoistway is by use of enclosed elevator lobbies. As mentioned in the original proposal reason statement, there are already provisions in the IFC to eliminate storage and furniture within occupant evacuation elevator and firefighter access elevator lobbies. As there are other required elevator lobbies to protect hoistways, this proposal is attempting to ensure that these elevator lobbies will not be used as overflow storage or staging areas.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal clarifies that storage is not permitted within any protected hoistway and does not have an impact on cost of construction.

F85-18

F86-18

IFC: 606.8, 606.8.1

Proposed Change as Submitted

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org)

2018 International Fire Code

Revise as follows

606.8 Standardized fire service elevator keys. Buildings with elevators equipped with Phase I emergency recall, Phase II emergency in-car operation, or a fire service access elevator shall be equipped to operate with a standardized fire service elevator key approved by the *fire code official* or a standardized key in accordance with ASME A17.1/CSA B44.

Exception: The owner shall be permitted to place the building's nonstandardized fire service elevator keys in a key box installed in accordance with Section 506.1.2.

606.8.1 Requirements for standardized fire service elevator keys. Standardized fire service elevator keys shall comply with all of the following:

1. All fire service elevator keys within the jurisdiction shall be uniform and ~~specific for the jurisdiction.~~ approved in accordance with Section 606.8. Keys shall be cut to a uniform key code.
2. Fire service elevator keys shall be of a patent-protected design to prevent unauthorized duplication.
3. Fire service elevator keys shall be factory restricted by the manufacturer to prevent the unauthorized distribution of key blanks. Uncut key blanks shall not be permitted to leave the factory.
4. Fire service elevator keys subject to these rules shall be engraved with the words "DO NOT DUPLICATE."

Reason: To eliminate a potential conflict with ASME A17.1/CSA B44 and all jurisdictions more flexibility in selection of a standardized keys.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This change will not impact cost since it allows more options and eliminates a potential conflict.

F86-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon concern that the fire code official could already allow such keys therefore the reference is unnecessary. (Vote: 14-0)

Assembly Action:

None

F86-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Kevin Brinkman, representing National Elevator Industry, Inc. (klbrinkman@neii.org) requests As Submitted.

Commenter's Reason: Request approval as submitted. This proposal was submitted by NEII but is was also reviewed with the ASME Code Coordination committee which includes members from ICC and NFPA. ASME A17.1/CSA B44 requires the use of an FEO-K1 key for operation of all switches for Firefighters Emergency Operation (FEO) on elevators. This requirement to A17.1/B44 was added based on meetings with firefighters and their request to have one unique key. The current language in 606.8.1 requires keys that are "... uniform and specific to a jurisdiction.". The phrase "... specific to a jurisdiction" could be misinterpreted to mean that each jurisdiction must have its own unique key that is different than all other jurisdictions. This interpretation creates a conflict with ASME A17.1/CSA B44. The proposed change would still require the same key to be used throughout the jurisdiction, but would allow that key to be used by other jurisdictions as well, and eliminate the conflict with A17.1/B44. This would increase safety by allowing firefighters called to assist in a neighboring jurisdiction to have the key necessary for operation of the FEO system.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since this change is to clarify the language and eliminate a potential conflict there is no change in the cost of construction.

F86-18

F87-18

IFC: 606.8.5, 315.3.3

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Add new text as follows

606.8.5 Storage. Furniture, materials or combustible waste shall not be stored in elevator cars or elevator machine rooms.

Exception: Blankets used for protection of elevator cab walls during construction or renovation.

Revise as follows

315.3.3 Equipment rooms. Combustible material shall not be stored in boiler rooms, mechanical rooms, elevator machine rooms, electrical equipment rooms or in *fire command centers* as specified in Section 508.1.5.

Reason: This is one of 17 proposals being submitted as a package relating to technical and organizational changes proposed for Chapter 6. While the Fire Code Committee will consider each proposal independently, the intent is for approval of all proposals in this package which have been submitted as a correlated set of companion code change proposals.

These changes will clarify that elevator cars and machine rooms are not to be used for storage. An exception is provided for blankets that are used for protecting the elevator cab walls.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. These areas are currently not permitted to be used for storage purposes.

F87-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved but was felt to have merit. More language regarding combustibility of furniture needs to be worked into the proposal to make it viable. (Vote: 13-1)

Assembly Action:

None

F87-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

606.8.5 Storage. ~~Furniture, materials or combustible waste shall not be stored~~ Storage is prohibited in elevator cars or elevator machine rooms.

Exception: Exceptions:

1. Blankets used for protection of elevator cab walls during construction or renovation.
2. Materials necessary for the operation and maintenance of the elevator equipment

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This modification addresses the concern raised by the Technical Committee. The new language in 606.8.5 is consistent with requirements for general storage restrictions in Section 315.

Fundamentally, any material should not be stored in either elevator cars or elevator machine rooms, other than (1) the blankets used to protect elevator cab walls during construction or renovation, and (2) materials in the elevator machine room that are necessary for the maintenance and operation of elevator equipment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

These areas are currently not permitted to be used for storage purposes.

F87-18

F91-18

IFC: SECTION 708, 708.1

Proposed Change as Submitted

Proponent: Bill McHugh, The McHugh Company, representing National Fireproofing Contractors Association (billmchugh-jr@att.net)

2018 International Fire Code

Add new text as follows

SECTION 708 SPRAY FIRE-RESISTIVE MATERIALS AND INTUMESCENT FIRE-RESISTIVE COATINGS

708.1 Maintaining Protection. The fire-resistance ratings of building elements, components or assemblies shall be maintained. The materials shall be securely bonded, not exhibit cracks, voids, spalls, delamination or any exposure to the substrate and be in accordance with the permitted fireproofing thicknesses. The materials shall be maintained in accordance with the listing and manufacturers instructions, where known.

Reason: We compliment the work of the Fire Code Action Committee and its successful F-113 proposal that resulted in new sections for maintaining assemblies in the IFC Chapter 7, Fire and Smoke Protection Features. There were several needed sections added to the International Fire Code through the F-113 Proposal. However, there was no section submitted at the time by the industry for sprayed fire-resistive materials (SFRM) or intumescent fire-resistive materials (IFRM) Fireproofing. This proposal adds the section to add a section on maintaining protection of building elements, structural members or assemblies receiving SFRM and IFRM Fireproofing.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This code proposal does not increase the cost of construction because all Fire and Smoke Protection Features are supposed to be maintained currently.

F91-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the new proposed section goes beyond what is expected for an inspection and they had issues with the language, specifically regarding what test method is required, "fireproofing thicknesses" and "where known." (Vote: 12-2)

Assembly Action:

None

F91-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Bill McHugh, representing National Fireproofing Contractors Association (billmchugh-jr@att.net) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

SECTION 708 SPRAY FIRE-RESISTIVE-RESISTANT MATERIALS AND INTUMESCENT FIRE-RESISTIVE COATINGS-RESISTANT MATERIALS

708.1 Maintaining Protection. ~~The fire resistance ratings of building elements, components or assemblies shall be maintained. The materials shall be securely bonded, not exhibit cracks, voids, spalls, delamination or any exposure to the substrate and be in accordance with the permitted fireproofing thicknesses. The materials shall be maintained in accordance with the listing and manufacturers instructions, where known~~Where required when the building was originally permitted and constructed, spray fire-resistant materials and intumescent fire-resistant materials shall be visually inspected to verify that the materials do not exhibit exposure to the substrate.

Commenter's Reason: The purpose of this public comment is to address the Fire-Safety Committee and Opponent comments during the Committee Action Hearings in Columbus, OH. The proposal complimented the work of the Fire Code Action Committee on Chapter 7 creating separate sections for each type of fire-resistance. The committee felt the proposal was valuable and needed in the International Fire Code as it adds maintenance of spray fire-resistant materials and intumescent fire-resistant materials to the code. However, they thought the language was not concise, clear and might be confusing to those inspecting the materials.

To address the committee concerns, the proposal has been modified to be very specific to the type of materials to be visually inspected and maintained. This public comment brings needed attention to spray fire-resistant and intumescent fire-resistant materials that protect the first item mentioned in 701.2, Structural members.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal only clarifies that spray fire-resistant materials and intumescent fire-resistant materials are to be maintained through mentioning specific materials that protect structural elements listed in 701.2.

F91-18

F92-18 Part I

IFC: Chapter 8, 801, 801.1, 808, 808.1, 808.2, 808.3, 808.4, 808.5

Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego, representing Self

2018 International Fire Code

CHAPTER 8 INTERIOR FINISH, DECORATIVE MATERIALS AND FURNISHINGS

SECTION 801 GENERAL

801.1 Scope. The provisions of this chapter shall govern interior finish, interior trim, furniture, furnishings, decorative materials and decorative vegetation ~~in on the interior and exterior of buildings~~. Existing buildings shall comply with Sections 803 through 808. New buildings shall comply with Sections 804 through ~~808~~809, and Section 803 of the International Building Code.

808 OUTDOOR ARTIFICIAL DECORATIVE VEGETATION

808.1 General. Artificial decorative vegetation placed outdoors, within 30 feet (9140 mm) of a building, or on an occupied roof of a building shall comply with this section.

808.2 Testing. Artificial decorative vegetation shall meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701. Meeting such criteria shall be documented and certified by the manufacturer in an approved manner. Alternatively, the artificial decorative vegetation shall be tested in accordance with NFPA 289, using the 20 kW ignition source, and shall have a maximum heat release rate of 100 kW.

808.3 Electrical fixtures and wiring. The use of unlisted electrical wiring and lighting on artificial decorative vegetation shall be prohibited. The use of electrical wiring and lighting on artificial trees constructed entirely of metal shall be prohibited.

808.4 Candles and open flames. Candles and open flames shall not be used on or within 5 feet of artificial decorative vegetation.

808.5 Maintenance. Artificial decorative vegetation shall be tested to demonstrate that the flame propagation performance criterion or the heat release criterion from Section 808.2, as appropriate, remains effective for the period for which the artificial decorative vegetation remains in service, as approved by the fire code official. Materials tested to Chapter 16 of NFPA 701 that retain the flame propagation performance shall be deemed acceptable.

Reason: The proposed code change is in response to the increased use of decorative artificial vegetation on occupied roofs, within interior courts in buildings and outdoor occupancies such as Group A-5 stadiums. In the event that plastics in the decorative combustible vegetation ignites it can spread fire to surrounding buildings and this potential was very visible when artificial palm trees on the pool deck at the Las Vegas Cosmopolitan Hotel ignited in July of 2015. The IBC and IFC presently only specifically regulate decorative artificial vegetation in buildings through the requirements in Section 807.4 that was added in the last code cycle. The hazards are just as important in outdoor occupancies as they are in indoor occupancies.

Occupied roofs typically are classified as Group A-2 or A-3 occupancies and outdoor stadiums are classified as Group A-5 both of which accommodate large numbers of people. Additionally, when placed in close proximity to a building they can spread fire to a building if ignited.

Outdoor use poses weathering problems due to moisture, UV exposure or cleaning chemicals necessary to freshen up the vegetation. As a result, testing is required after weathering conditioning per the requirements of Chapter 16 in NFPA 701. Since there are no specific standards and tests done for this specific type of outdoor plastic compliance with the weathering accelerated weathering testing per ASTM D4329 and ASTM D4587 where fire retardant coating is used is not being required to allow the fire code official flexibility.

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

Artificial decorative vegetation protected with fire retardants need to be tested for outdoor weathering.

F92-18 Part I

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had multiple issues with the proposal including: concern with the maintenance and enforcement, some of the requirements are electrical in scope, the term "permanent" is not specified, there is no size limit, the distance requirement is too high and no justification was provided, construction types are not included and there is no account for weather conditions. (Vote: 14-0)

Assembly Action:

None

F92-18 Part I

Individual Consideration Agenda

Public Comment 1:

Proponent: Ali Fattah, City of San Diego, representing City of San Diego (afattah@sandiego.gov) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

SECTION 320 ARTIFICIAL COMBUSTIBLE VEGETATION

320.1 Artificial Combustible Vegetation on Roofs and Near Buildings. Artificial combustible vegetation exceeding 6 feet (1828.8 mm) in height and permanently installed outdoors, within 5 feet (1524 mm) of a building or on the roof of a building, shall comply with Section 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

Commenter's Reason: This public comment has been submitted to address the constructive feedback offered during the committee Action Hearing. While the Fire Code Committee did not approve the original change several members of the committee and speakers in opposition encouraged submitting a public comment because they found that the hazards of artificial vegetation to be valid.

The proposal has been simplified and references applicable provisions in Section 806 and 807. The original proposal had not intended to change those sections but merely copied their requirements into the proposed new Sections. Several speakers and committee members raised issues with the electrical requirements in Section 807.4.2.

The proposal as revised in this public comment mainly focuses on regulating installations in close proximity to buildings or on the roofs of buildings regardless of whether occupied or not since the intent is structure protection and not occupant protection. This addresses some issues raise by the committee regarding applicability.

A height limit of 6 ft was added below which the proposed regulations will not apply. It seems to be a reasonable height and is representative of most common interior applications. An area limit could not be included since fire testing will be necessary to do so. A request was made to the NFPA Foundation for funding and was not approved so resources do not exist now to address this question.

Terms such as permanent and installed are intended to lead the code user to understand that transient items are not being regulated by the proposed section rather it is large Artificial Combustible Vegetation. This should also address a committee members objection that the original proposal would have regulated table top ornaments.

We reduced the fire separation distance originally included in the proposal to 3 ft for two reasons. The first reason is that the IFC does not restrict the location of such materials wen placed on the interior of a building. Secondly, since exterior applications do not have the benefit of fire sprinkler protection it seems prudent to include some distance. Additionally, the proposal does not differentiate between types of construction or exterior finishes however the 5 ft distance has a rational based on the distance in IBC Table 705.8 when exterior wall openings are first permitted in exterior walls that have unprotected openings in non-sprinklered buildings. We should keep in mind that the materials will be labeled to comply with the requirements for interior installations.

Proponent sympathizes with a comment made by a speaker that spoke to the limited resources Fire Code Officials must enforce the fire code and that the additional regulations proposed will add an additional burden. The regulations are necessary to provide a code section to reference when a violation is found of the section in conjunction with other violations. This is like traffic citations given for mobile phone use while driving where it is less likely for law enforcement to make a traffic stop only for that violation. However, if the violation also includes speeding or other moving violations it can be added to the traffic citation.

Finally, the regulations addressing exterior weathering were removed from the proposal since the NFPA 701 edition that will be adopted by the 2021 IBC will require compliance for outdoor installations. It is expected that the protection will remain for the service life of the material.

Bibliography: Two interesting articles might be useful as references were used in developing the code change <https://www.nfpa.org/News-and-Research/Publications/NFPA-Journal/2016/May-June-2016/Features/Combustible> and <https://library.ul.com/wp-content/uploads/sites/40/2016/09/10266-Artificial-Trees-White-Paper-FinalR1.pdf>

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This code change will minimally increase the cost of construction by extending the regulation to the exterior of the building. However, materials compliance for interior use may require some modification to address exterior weathering. At present the materials address in this code change are regulated by code officials intermittently and inconsistently and the code change will improve uniformity and consistency of enforcement which will reduce the cost of construction due to increase volume of fabrication. .

F92-18 Part I

F92-18 Part II

IBC: Chapter 8, 801, 801.1, 802.3, 807, 807.1, 807.2, 807.3, 807.4

Proposed Change as Submitted

Proponent: Ali Fattah, City of San Diego, representing Self

2018 International Building Code

CHAPTER 8 INTERIOR FINISHES AND DECORATIVE MATERIALS

SECTION 801 SCOPE

801.1 Scope. The provisions of this chapter shall govern the use of materials used as *interior finishes, trim* and *decorative materials*.

~~FF~~ **802.3 Decorative materials and trim.** *Decorative materials* and *trim* shall be restricted by combustibility, fire performance or flame propagation performance criteria in accordance with Section 806 for the interior of the building and Section 807 for the exterior of the building.

807 ARTIFICIAL DECORATIVE VEGETATION ON BUILDINGS AND IN OUTDOOR OCCUPANCIES

807.1 General. Fixed artificial decorative vegetation placed in outdoor occupancies or on an occupied roof of a building shall comply with this section.

807.2 Testing. Artificial decorative vegetation shall meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701. Meeting such criteria shall be documented and certified by the manufacturer in an approved manner. Alternatively, the artificial decorative vegetation shall be tested in accordance with NFPA 289, using the 20 kW ignition source, and shall have a maximum heat release rate of 100 kW.

807.3 Electrical fixtures and wiring. The use of unlisted electrical wiring and lighting on artificial decorative vegetation shall be prohibited. The use of electrical wiring and lighting on artificial trees constructed entirely of metal shall be prohibited.

807.4 Ignition sources and maintenance. Ignition sources and maintenance of outdoor artificial vegetation shall be in accordance with Section 808.4 and 808.5 of the IFC.

Reason: The proposed code change is in response to the increased use of decorative artificial vegetation on occupied roofs, within interior courts in buildings and outdoor occupancies such as Group A-5 stadiums. In the event that plastics in the decorative combustible vegetation ignites it can spread fire to surrounding buildings and this potential was very visible when artificial palm trees on the pool deck at the Las Vegas Cosmopolitan Hotel ignited in July of 2015. The IBC and IFC presently only specifically regulate decorative artificial vegetation in buildings through the requirements in IFC Section 807.4 that was added in the last code cycle. The hazards are just as important in outdoor occupancies as they are in indoor occupancies.

Occupied roofs typically are classified as Group A-2 or A-3 occupancies and outdoor stadiums are classified as Group A-5 both of which accommodate large numbers of people. Additionally, when placed in close proximity to a building they can spread fire to a building if ignited.

Outdoor use poses weathering problems due to moisture, UV exposure or cleaning chemicals necessary to freshen up the vegetation. As a result, testing is required after weathering conditioning per the requirements of Chapter 16 in NFPA 701. Since there are no specific standards and tests done for this specific type of outdoor plastic compliance with the weathering accelerated weathering testing per ASTM D4329 and ASTM D4587 where fire retardant coating is used is not being required to allow the fire code official flexibility.

Cost Impact: The code change proposal will increase the cost of construction. The proposed code change will require that products utilizing fire retardants to demonstrate the ability to weather in outdoor environments.

Public Hearing Results

Committee Action:

Disapproved

Assembly Action:

None

F92-18 Part II

Individual Consideration Agenda

Public Comment 1:

Proponent: Ali Fattah, City of San Diego, representing City of San Diego requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

SECTION 429 ARTIFICIAL DECORATIVE VEGETATION

429.1 Artificial decorative vegetation. Artificial decorative vegetation exceeding 6 feet (1830 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building, or on the roof of a building, shall comply with Section 320.1 of the *International Fire Code*.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

Commenter's Reason: This public comment has been submitted to address the constructive feedback offered during the lengthy debate in both the Fire Safety Committee and the Fire Code Committee during the Committee Action Hearing. While the Fire Safety Committee did not approve the original change several members of the committee and speakers in opposition encouraged submitting a public comment because they found that the hazards of artificial vegetation to be valid.

The proposal has been simplified and is proposed to be moved to a new Section in IBC Chapter 4 where we had initially proposed the proposed regulations. ICC staff suggested that the proposal be added to Chapter 8 of the IBC by modifying the scope of the chapter. We repeatedly received comments that code users will not think to go to Chapter 8 that addresses materials within buildings when the proposed regulations are applicable to installations on the exterior of a building. Furthermore, we added further simplification by referencing a proposed Section 320.1 proposed for the the International Fire Code. This will address the majority of the comments we heard.

Additionally, we have limited the scope of the requirement to apply to artificial trees that have a height exceeding 6 ft and when located within 3 feet of a building. This addresses concerns raised by both committees regarding the broadness of the scope and applicability of the regulation.

Using the term permanent addresses cases where the structure used to frame the artificial vegetation is permanently bolted to the building or where it is installed in a large heavy planter that can not be readily moved. We hope that this addresses issues raised regarding architects placing the artificial decorative vegetation on support systems that can be readily moved with casters. Additionally the height limit and using the term permanent should also exclude table ornaments as was raised by a member of the Fire Code Committee.

A height limit of 6 ft was added below which the proposed regulations will not apply. It seems to be a reasonable height and is representative of most common interior applications. Additionally fences having a 6 ft high are exempted from a building permit so this was also used in determining the height limit. An area limit could not be included since fire testing will be necessary to do so. A request was made to the NFPA Foundation for funding and was not approved so resources do not exist now to address this question.

Terms such as permanent and installed are intended to lead the code user to understand that transient items are not being regulated by the proposed section rather it is large Artificial Combustible Vegetation. This should also address a committee members objection that the original proposal would have regulated table top ornaments.

We reduced the fire separation distance originally included in the proposal to 5 ft for two reasons. The first reason is that the IFC does not restrict the location of such materials when placed on the interior of a building. Secondly, since exterior applications do not have the benefit of fire sprinkler protection it seems prudent to include some distance. Additionally, the proposal does not differentiate between types of construction or exterior finishes however the 5 ft distance has a

rational based on the distance in IBC Table 705.8 when exterior wall openings are first permitted in exterior walls on non-sprinkler protected buildings. We should keep in mind that when the proposed section is implemented that the combustible materials will be labeled to comply with the requirements for interior installations.

Finally, the regulations addressing exterior weathering were removed from the proposal since the NFPA 701 edition that will be adopted by the 2021 IBC will require compliance for outdoor installations. It is expected that the protection will remain for the service life of the material.

The proposal references a Section in the IFC and if Part I of this code change or if the public comment to code Change F21-18 are not approved by this membership the correlating committee should not adopt Part II of this code change. We believe that this pointer to the IFC is necessary since our experience has been that these elements may come in during initial construction or as alterations to existing buildings.

While the IBC does not regulate the proximity of live irrigated vegetation to buildings, the proposed code change is necessary due to the demonstrated hazards of fire as we show in the original proposal. A building permit is not required for live vegetation but is required for structures that resist wind and seismic loads and their self weight and to address loads imposed on the supporting structure or foundation.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. We believe that there will be an increase in the cost of construction however since many of the artificial trees have been installed in the interior of a building the same compliant materials are expected to be installed on the exterior. Additionally since these items have not been regulated by the IBC and IFC we have no baseline to compare to since their use has been relatively recent in the past 5 to 10 years. The fire incident we referenced included elements that were constructed under the 2012 IBC/IFC or the prior editions which were developed almost 10 years ago.

F92-18 Part II

F93-18

IFC: 806.1.4 (New), Chapter 80

Proposed Change as Submitted

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

2018 International Fire Code

Add new text as follows

806.1.4 Fire retardant treatments for natural cut trees. Fire retardant treatments applied to natural cut trees shall be tested by an approved agency and shall comply with one of the following:

1. Both Test Method 1 and Test Method 2 of ASTM E3082.
2. Exhibit a maximum rate of heat release not exceeding 100 kW when applied in accordance with the manufacturer's recommendations and tested in accordance with section 5.5 of NFPA 289.

Add new standard(s) follows

ASTM

ASTM International
100 Barr Harbor Drive, P.O. Box
C700
West Conshohocken PA 19428-2959
US

E3082-17:

Standard Test Methods for Determining the Effectiveness of Fire Retardant Treatments for Natural Christmas Trees

Reason: It has been found that many treatments are offered for sale that are said to improve the fire performance of natural Christmas trees. The Natural Christmas Tree Association has been very worried for some time about the efficacy of some of these products. It has been found that the use of poorly formulated and untested fire retardant treatments can accelerate the drying out of the Christmas tree and actually worsen the fire danger. The Natural Christmas Tree Association approached both ASTM (committee E05 on fire standards) and individual members off the NFPA Fire Tests committee to develop a test method for assessing whether the treatments offered for sale are actually doing as claimed by manufacturers. The state of California has a fire test that it uses to approve such treatments, based on a small scale fire test, but other states do not.

As a result of these concerns, ASTM has now developed and published ASTM E3082 for that purpose. It contains both a small scale test (Test Method 1) and a full scale test (Test Method 2). In order to comply with the requirements of ASTM E3082 a treatment must comply with both tests, and then it will be said to have "passed" the test. Test Method 1 is similar to the test used by the state of California for its requirements. Test Method 2 is a full scale heat release test largely based on UL Outline of Investigation 2358, "Fire Tests of Pre-Lit Artificial Seasonal Use Trees and Other Seasonal Decorative Items".

NFPA has developed a procedure within NFPA 289 (a heat release test for full scale individual fuel items) to also test Christmas tree treatments. The test in NFPA 289 (section 5.5) is similar (but not identical) to the full scale test in ASTM E3082 (Test Method 2) and does not have pass fail criteria. Therefore the pass fail criteria recommended are those used when testing to NFPA 289 in more than one section of the IFC (807.3, 807.4.1, 807.5.1.1, etc.), which are a heat release rate not exceeding 100 kW.

NFPA statistics show that, between 2011 and 2015, U.S. fire departments responded to an estimated 200 structure fires, per year, caused by Christmas trees resulting in an annual average of 6 deaths, 16 injuries and \$14.8 million in property damage. When comparing Christmas tree fires to other reported home fires, 1 out of every 32 home fires that began with a Christmas tree resulted in a death compared to 1 death out of every 143 reported home fires.

The use of an appropriate fire retardant treatment is a passive means or protection, which adds fire safety to the active means in 806.1.1 and 806.1.3.

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

This will provide added fire safety but it will require manufacturers of fire retardant treatments to conduct some fire testing to demonstrate the effectiveness of their products.

Analysis: A review of the standard proposed for inclusion in the code, ASTM E3082-17 Standard Test Methods for Determining the Effectiveness of Fire Retardant Treatments for Natural Christmas Trees, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F93-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the proposal has enforcement and misinterpretation issues and there is currently no requirement to have the treatment. It was suggested to add the language of "where applied" to improve the clarity of the requirement. (Vote: 11-3)

Assembly Action:

None

F93-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Tim Earl, representing GBH International (tearl@gbhinternational.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

806.1.4 Fire retardant treatments for natural cut trees. ~~Fire~~ Where fire retardant treatments are applied to natural cut trees ~~shall~~, the fire retardant treatment shall be tested by an approved agency and shall comply with ~~one of the following:~~

- ~~1. Both both~~ Test Method 1 and Test Method 2 of ASTM E3082.
- ~~2. Exhibit a maximum rate of heat release not exceeding 100 kW when applied in accordance with the manufacturer's recommendations and tested in accordance with section 5.5 of NFPA 289.~~

Commenter's Reason: Both testimony and the committee highlighted that it is important to clarify that this code section only becomes a requirement "where fire retardant treatments are applied" meaning that this does not introduce a requirement that any treatment be applied to natural cut trees. It was also noted that it must be clarified that the requirement applies to the treatment and does not apply to the tree. Therefore, it is the commercial treatment that needs to be tested and not the individual trees.

Also, it was pointed out enforcement would be easier if the packaging for the fire retardant treatment was labeled simply to comply with the ASTM test, which has its own pass-fail criteria.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. Manufacturers of fire retardant treatments will need to perform fire tests to prove that their treatments actually increase the fire performance of the trees upon which they are applied.

F93-18

F95-18

IFC: 808.4

Proposed Change as Submitted

Proponent: Misty Guard, representing Bradley Corporation (Misty.Guard@bradleycorp.com)

2018 International Fire Code

Revise as follows

808.4 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall comply with ~~Section 803~~Table 803.3.

Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with Section 803.1.2.

Reason: The current requirement references all of Section 803, whereas the intent is to apply Table 803.3 for interior finish. Combustible lockers are made of different materials, including wood, ABS, and HDPE. If the material meets the interior finish requirements of Table 803.3 then they should be permitted.

The current Section 803 would appear to apply different requirements for wood, ABS, and HDPE lockers. The exception to allow any wood to be classified as Class C is acceptable. There is an implication that HDPE would be regulated differently than ABS. Section 803.9 could be incorrectly interpreted as applying to HDPE lockers. However, this section was never intended to apply to lockers. The original change adding this section addressed large areas of HDPE panels as an interior finish. No mention was made in the code change of lockers.

HDPE lockers have been installed for the last 25 years, as have ABS lockers. Many fire stations, schools, and health club like the added benefits of HDPE and ABS lockers. From a cleanliness and sanitation standpoints, HDPE and ABS lockers are superior to many metal lockers.

A study was completed by NFPA Research entitled, "Non-Residential Structure Fires That Originated in Lavatories, Locker Rooms or Coat Check Rooms," dated November 2017, authored by Marty Ahrens. The report shows no fire issue with HDPE or ABS lockers. There are no fire deaths reported from fires originating in a locker room. Hence, the perceived fire hazard does not exist with lockers in commercial building that meet the interior finish requirements of Table 803.3. This change is needed for clarification.

Bibliography: Ahrens, M. (2017). Non-Residential Structure Fires that Originated in Lavatories, Locker Rooms or Coat Check Rooms. Quincy, MA: NFPA Research.

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

F95-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they did not agree with the proposed revised reference to the table and that it was incorrect. (Vote: 14-0)

Assembly Action:

None

F95-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Julius Ballanco, JB Engineering and Code Consulting, P.C., representing Building Owners and Managers Association International (jbenigneer@aol.com); Andrew Klein, representing Building Owners and Managers Association International (andrew@asklein.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

808.4 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall comply with ~~Table 803.3~~ Section 803.

Exception:Exceptions:

1. Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with Section 803.1.2..
2. Plastic lockers located in locker rooms shall meet a Class B or C classification in accordance with Section 803.1.2 based on the requirements of Table 803.3.

Commenter's Reason: Locker rooms are a unique location and also where lockers are located. Quite often plastic lockers are installed because of they are a high quality to resist mold growth, corrosion resistance, readily cleanable, and quiet. Locker rooms are often subjected to continuous high humidity, hence, the benefits of plastic lockers. The plastic lockers typically meet the Class C requirements.

When a change was made to regulate lockers in the 2012 edition of the Fire Code, the result was that plastic HDPE lockers were required to meet Class A requirements and be tested to NFPA 286. The same requirements do not apply to ABS or PVC lockers. Plastic lockers are made from all these materials. This results in a prejudicial requirement against HDPE lockers without technical justification. The initial code change on lockers only stated that the can be a significant fire load with plastic lockers. However, no fire load was given, no fire statistics were given, nor were any fire death related to locker fires presented.

Prior to the code change to the Fire Code, lockers in locker rooms were considered the equivalent to furniture. Plastic lockers, including HDPE lockers, have been used and installed for more than 25 years. Interestingly, many HDPE plastic lockers are installed in firehouses and fire stations. Fire statistics from NFPA indicate that plastic lockers have NOT been a fire concern. A copy of the NFPA report is available upon request from JBenigneer@aol.com.

Plastic lockers are often located near plastic shower modules. These plastic shower modules do not have to meet the requirements of NFPA 286. Only one product line in a locker room has been singled out, HDPE plastic lockers. This modification corrects the requirements and treats all plastic locker equally.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This will revert the requirements for lockers to the 2009 and earlier edition whereby all plastic lockers can be evaluated based on their flame spread and smoke developed rating. A change to the 2012 edition added special requirements for one type of locker which eliminates the lockers from use without any technical justification.

F95-18

F100-18

IFC: 901.4.4, 901.5, 901.5.1, 901.6, 901.8

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

901.4.4 Additional fire protection systems. In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the *fire code official* determines that access for fire apparatus is unduly difficult, the *fire code official* shall have the authority to require additional ~~safeguards. Such safeguards include, but shall not be limited to, the following: automatic fire detection systems, fire alarm systems, automatic fire extinguishing systems, standpipe systems, or portable or fixed extinguishers.~~ Fire protection equipment safeguards and fire protection systems. Fire protection systems required under this section shall be installed in accordance with this code and the applicable referenced standards.

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~~ 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.

901.5.1 Occupancy. It shall be unlawful to occupy any portion of a building or structure until the required fire ~~detection, alarm and suppression~~ protection systems have been tested and *approved*.

901.6 Inspection, testing and maintenance. ~~Fire detection and alarm systems, emergency alarm systems, gas detection systems, fire extinguishing systems, mechanical smoke exhaust systems and smoke and heat vents protection systems~~ 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 in accordance with Section 901.8.

901.8 Removal of or tampering with equipment. It shall be unlawful for any person to remove, tamper with or otherwise disturb any fire ~~hydrant, fire detection and alarm system, fire suppression system or other fire appliance~~ protection system required by this code except for the purposes of extinguishing fire, training, recharging or making necessary repairs or where *approved* by the *fire code official*.

Reason: Section 901.1 through 901.4.3 uses "*Fire Protection System*" and the remainder of 901 uses a list of multiple systems, many times leaving out sprinkler systems and other types of systems.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction Language clarifies and encompasses all systems that meet the definition. No cost involved.

F100-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason regarding the clarification of the language in the sections. (Vote: 14-0)

Assembly Action:

None

F100-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jeffrey Hugo, representing National Fire Sprinkler Association (hugo@nfsa.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

901.4.4 Additional fire protection systems. In occupancies of a hazardous nature, where special hazards exist in addition to the normal hazards of the occupancy, or where the *fire code official* determines that access for fire apparatus is unduly difficult, the *fire code official* shall have the authority to require additional safeguards and fire protection systems. Fire protection and life safety systems required under this section shall be installed in accordance with this code and the applicable referenced standards.

901.5 Installation acceptance testing. *Fire protection and life safety 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.

901.5.1 Occupancy. It shall be unlawful to occupy any portion of a building or structure until the required fire protection and life safety systems have been tested and *approved*.

901.6 Inspection, testing and maintenance. Fire protection and life safety systems shall be maintained in an operative condition at all times, and shall be replaced or repaired where defective. Nonrequired *fire protection and life safety systems* and equipment shall be inspected, tested and maintained or removed in accordance with Section 901.8.

901.8 Removal of or tampering with equipment. It shall be unlawful for any person to remove, tamper with or otherwise disturb any fire protection and life safety system required by this code except for the purposes of extinguishing fire, training, recharging or making necessary repairs or where *approved* by the *fire code official*.

Commenter's Reason: This correlates the beginning of Ch. 9 to the action on F97-18 by adding in "...and life safety..."

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Correlation.

F100-18

F106-18

IFC: 903.2.7, 903.2.9 (IBC: [F] 903.2.7, [F] 903.2.9)

Proposed Change as Submitted

Proponent: Ellie Klausbruckner, Klausbruckner & Associates Inc., representing Klausbruckner & Associates, Inc. (ek@klausbruckner.com)

2018 International Fire Code

Revise as follows

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 where the 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* exceeds 5,000 square feet (464 m²).
5. A Group S-1 occupancy where the area used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).

Reason: In a lot of retail or storage areas there may be as little as a few upholstered furniture for display or storage. These sections imply if the area of the display or storage of upholstered furniture is even 10 sq ft and this display is located in a very large room/building, that the entire room/building needs to be sprinklered. We do not believe this was the intent of this section.

Cost Impact: The code change proposal will decrease the cost of construction. This is intended to clarify that the area of the upholstered display or storage and not the entire room needs to be considered. A lot of businesses having small number of upholstered furniture will no longer be "lumped" together with facilities that are of actual concern.

F106-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason and that the current language is overly restrictive as written. The addition of "where the area" provides clarification that it is the area used that determines the condition. (Vote: 8-6)

Assembly Action:

None

F106-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

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 where the area used for the display and sale of upholstered furniture or mattresses exceeds 5,000 square feet (464 m²).~~

903.2.7.2 Group M upholstered furniture or mattresses. An *automatic sprinkler system* shall be provided throughout a Group M fire area where the 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* exceeds 5,000 square feet (464 m²).
5. ~~A Group S-1 occupancy where the area used for the storage of upholstered furniture or mattresses exceeds 2,500 square feet (232 m²).~~

903.2.9.3 Group S-1 upholstered furniture and mattresses. An *automatic sprinkler system* shall be provided throughout a Group S-1 fire area where the area used for the storage of upholstered furniture exceeds 2,500 square feet (232 m²).

Exception: Self-service storage facilities no greater than one story above grade plane where all storage spaces can be accessed directly from the exterior.

Commenter's Reason: This public comment is intended to correlate the language of F102-18 which was approved by the committee as modified and F106-18 which was approved as submitted by the committee.

In a lot of retail or storage areas there may be as little as a few upholstered furniture for display or storage. These sections imply if the area of the display or storage of upholstered furniture is even 10 sq ft and this display is located in a very large room/building, that the entire room/building needs to be sprinklered. We do not believe this was the intent of this section.

This public comment addresses a number of issues dealing with the suppression requirements for spaces containing upholstered furniture or mattresses.

The term Occupancy is replaced with fire area to clarify that the target hazard is the space containing the hazard.

The threshold language has been dropped down to its own subsection to provide for suppression being installed only within the target hazard fire area, not the entire building the fire area may be located within. An exception has been added to the S-1 trigger for one story self-service storage facilities where all storage spaces can be accessed from the exterior.

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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

By limiting the fire suppression requirement to the targeted hazard fire area instead of suppressing the whole building, the cost of construction could be reduced in certain situations.

This is intended to clarify that the area of the upholstered display or storage and not the entire room needs to be considered. A lot of businesses having small number of upholstered furniture will no longer be "lumped" together with facilities that are of actual concern.

Public Comment 2:

Proponent: Marcelo Hirschler, GBH International, representing GBH International (mmh@gbhint.com) requests Disapprove.

Commenter's Reason: This proposal is unenforceable since "the area used for the display and sale of upholstered furniture or mattresses" or "the area used for the storage of upholstered furniture or mattresses" can be changed continuously as a function of the number of items available for storage, display or sale. Proposal F102, also accepted by the committee (with modifications) is clear, in that it addresses the "fire area" which is a function of the design of the building and will not depend on the number of items present.

Note that there was significant amount of opposition from the committee (8-6).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposal F102 is the one that decreases the cost impact. Disapproving this proposal has no effect.

F106-18

F110-18

IFC: 903.2.10, 903.2.11.3 (IBC: [F]903.2.10, [F]903.2.11.3)

Proposed Change as Submitted

Proponent: Jeffrey Shapiro, representing National Fire Sprinkler Association (jeff.shapiro@intlcodeconsultants.com)

2018 International Fire Code

903.2.10 Group S-2 enclosed parking garages. An automatic sprinkler system shall be provided throughout buildings classified as enclosed parking garages in accordance with Section 406.6 of the International Building Code where either where any of the following conditions exists:

1. Where the fire area of the enclosed parking garage in accordance with Section 406.6 of the International Building Code exceeds 12,000 square feet (1115 m²).
2. Where the enclosed parking garage in accordance with Section 406.6 of the International Building Code is located beneath other groups.

Exception: Enclosed parking garages located beneath Group R-3 occupancies.

3. Where the fire area of the open parking garage in accordance with Section 406.5 of the International Building Code exceeds 48,000 square feet (4460 m²).

903.2.11.3 Buildings 55 feet or more in height. An automatic sprinkler system shall be installed throughout buildings that have one or more stories with an occupant load of 30 or more located 55 feet (16 764 mm) or more above the lowest level of fire department vehicle access, measured to the finished floor.

~~Exception: Exceptions:~~

~~1. Open parking structures.~~

~~2. Occupancies in Group F-2.~~

Reason: Historically, open parking garages have been considered to have a very low fire risk, which has led to dozens of special allowances for reduced code requirements in these occupancies. Fire tests run decades ago offered some support for this perspective. However, it is common knowledge that much of what makes up a vehicle today is combustible, and bodies and interior components that may previously have been of steel are now primarily plastic, rubber, fiberglass and lightweight metals, facilitating vehicle-to-vehicle fire spread and production of dense combustible smoke layers. Stored energy systems in electric vehicles also increase the fuel load. Nevertheless, the wisdom of exempting open parking garages from many code requirements that would otherwise apply has tended to go unchallenged, lacking sufficient evidence to demonstrate the existence of a problem. That has now changed. An open parking garage fire in Liverpool UK on January 1, 2018 demonstrated the fire risk associated with the new world order of vehicle construction. The concrete building and 1,400 cars were destroyed by a fire that reportedly started in a single vehicle's engine compartment.

The thought that allowing smoke to escape from an open parking garage perimeter will entirely mitigate fire risk is certainly debunked by this incident, and this proposal seeks to recognize that these structures and their contents can present significant challenges to the fire service and result in catastrophic fire losses. The recommended sprinkler threshold based on building height is consistent with the threshold that was established years ago for most occupancies, and the reason for exempting open parking garages is no longer evident. The proposal also provides for an area based threshold, which is very generous compared to other occupancies that might be argued as having similar, or even lesser, fire loads. The recommended value is four times larger than what is applicable to enclosed garages, recognizing that, while there may be some benefit to perimeter openings, the fire service will ultimately be relied on to control these fires if sprinklers are not provided. Therefore, it is appropriate to limit the size of a fire area in these building so that there is a reasonable ability of the fire service to access and extinguish a fire before it becomes uncontrollable.

Cost Impact: The code change proposal will increase the cost of construction. Yes, there is a cost increase.

F110-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 2018 International Building Code

[F] 403.3 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 403.3.3.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

- ~~1. Open parking garages in accordance with Section 406.5.~~
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are separated from the remainder of the building by not less than 1-hour fire barriers constructed in accordance with Section 707 or not less than 2-hour horizontal assemblies constructed in accordance with Section 711, or both.

2018 International Fire Code

914.3.1 Automatic sprinkler system. Buildings and structures shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 and a secondary water supply where required by Section 914.3.2.

Exception: An automatic sprinkler system shall not be required in spaces or areas of:

- ~~1. Open parking garages in accordance with Section 406.5 of the International Building Code.~~
2. Telecommunications equipment buildings used exclusively for telecommunications equipment, associated electrical power distribution equipment, batteries and standby engines, provided that those spaces or areas are equipped throughout with an automatic fire detection system in accordance with Section 907.2 and are 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 not less than 2-hour horizontal assemblies constructed in accordance with Section 711 of the International Building Code, or both.

Committee Reason: Approval of the modification is based on the need to revise the high-rise sections in order to be consistent with the revision to Section 903.2.11.3. Approval of the proposal is based upon the proponent's published reason. (Vote: 10-4)

Assembly Action:

None

F110-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Jonathan Humble, American Iron and Steel Institute, representing American Iron and Steel Institute (jhumble@steel.org)requests Disapprove.

Commenter's Reason: We recommend that this proposal be disapproved because the proposal:

- Lacks technical substantiation to warrant this change, and
- Raises more questions about vehicle fires.

The substantiation of the code change proposals relies heavily on the incident in Merseyside, U.K. Using that information, in conjunction with other information provided to us, we find:

The report [1] by Merseyside Fire & Rescue Service recommends automatic fire sprinklers in combination with adequate floor (parking level tier) drains, but does not address quantity and location of drains necessary to assist in mitigating fires as a result of the spillage and ignition of fuel combined with the water from the automatic fire sprinklers. The code change proposal also recommends sprinkler protection however it does not address the coordination or relationship with drainage.

The report [1] discussed the use of joints for drainage with PVC type pipes as a contributing factor in the spread of fire below the incident floor. In the US such a system is not common in the construction of open parking structures as joints in floors are normally sealed.

Both the report [1] and testimony at the spring code hearing discussed the construction of vehicles in today's market as containing more plastic components which could have contributed to the fire spreading. However, this is merely a general claim. We do not know how many of the plastic parts actually contributed since there are also plastic parts attached to the engine block of vehicles which do not readily combust. Therefore, it is clear that this subject requires further study as to what did or did not contribute to the spread of the fire.

Parking structures in North America continue to have a very low rate of incident as borne out through testimony by the proponent and the many studies conducted from 1972 through 2011 [2,3,4,5].

The proposal's substantiation raises more questions about other circumstances which involve vehicles, such as: surface parking lots, automobile retail establishments, etc. which had not been addressed by this code change submission or any other code change proposals.

All of the above suggest we should not just accept this proposal, but rather consider evaluating this subject further.

Bibliography: [1] MF&RS, "Kings Dock Car Park Fire Protection Report April 2018", Merseyside Fire & Rescue Service, Service Headquarters, , Bridle Road, Bootle, Merseyside, United Kingdom, L30 4YD, April, 2018.

[2] MRA, "Survey of Fire Experience in Automobile Parking Structures in the United States and Canada", Market Research Associates, New Jersey, 1972.

[3] MRA, "1979 Update of the Survey of Fire Experience in Automobile Parking in the United States and Canada", Market Research Associates, New Jersey, 1979.

[4] PMR, "Parking Garage Fires - A Statistical Analysis of Parking Garage Fires in the United States: 1986-1988", Parking Market Research Company, McLean, VA, 1992.

[5] NPA, "Parking Structure Fire Facts - A Summary of Current Research", National Parking Association Consultants Council, 2011.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. This public comment to disapprove will decrease the cost of construction as it will remove the proposed requirement for an automatic fire suppression system for open parking structures.

Public Comment 2:

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Stephen V. Skalko, P.E. & Associates, LLC (svskalko@svskalko-pe.com); Jason Krohn, Precast/Prestressed Concrete Institute, representing Precast/Prestressed Concrete Institute (jkrohn@pci.org); William Hall, Portland Cement Association, representing Alliance for Concrete Codes and Standards (jhall@cement.org) requests Disapprove.

Commenter's Reason: The proponent of F110-18 did not provide any technical documentation with the expected robustness needed to make such a drastic change to the building code by requiring open parking garages to be fully sprinklered and therefore should be disapproved. The following points are offered to support this position of Disapproval.

The recent fire loss in an open parking garage, that the Fire Committee found compelling in the Reason Statement of the proponent of F110-18, involves a fire incident that occurred in the UK at the first of 2018. All the details of this incident were not known at the time of the Code Action Hearing (CAH). However, upon review of the final report by the Merseyside Fire and Rescue Service (MFRS), the parking garage in question, referred to as a car park in the UK, had design features that likely contributed to fire spread between floors resulting in a far larger number of vehicles becoming involved than normal for vehicle fire incidences [Merseyside Fire Rescue Service, *Kings Dock Car Park Fire Protection Report*, April 2018, Merseyside, UK].

The following are two of the most notable differences of these design features contributing to the spread of fire in the UK car park incident:

- ○ The car park had a light gauge aluminum drainage tray attached to the underside of each precast floor panel and in line with the joint of the precast floor system. The trays lead to plastic vertical piping to transfer liquids to the building storm water drainage system. The design called for a 1/2-inch gap between floor panels to allow drainage into the aluminum tray below. This gap in the floor joints allowed burning fuel spills from vehicle gas tanks to flow directly to floors below which spread fire to vehicles on other floors.

In the United States the floor joints are not left open. They are typically sealed by a combination backer rod and sealant or covered by the placement of a concrete topping with tooled and sealed joints. This not only minimizes spread of fire to floors below by leaking fuels, but also inhibits the spread of flames from the incident floor to vehicles on floors above.

- ○ The building code requirements in the UK permitted only a 15-minutes structural fire resistance of the precast concrete floors for the Kings Dock car park. The fire exposure from the initial vehicle (and subsequent vehicles) damaged the underside of the floor panels above sufficient enough to permit the fire to extend upward to vehicles on the next parking level.

In the US the typical precast floor systems in open parking garages meets at least a minimum of a 1-hour fire resistance, which increases significantly the ability to prevent fire spread between floors.

A study of car park fires in the UK showed a total 3,096 fire incidences over a twelve-year period [BD2552 *Fire Spread in Car Parks*, Building Research Establishment for Department for Communities and Local Government, December 2010]. The average number of car park fires per year for that period was 258/year. This represents a very low number of incidences per year and thus low risk for fires in car parks. The experience with fire incidences in the US is also very low risk for this building occupancy type.

- ○ The US Fire Administration statistics show an average of over 1.7 million fires [FA-311, *Fire in the United States 1994-2004*, 14th edition, August 2007] for the period from 1999 to 2002. When compared to the average total parking garage fires (1760 incidents) described in an NFPA study of parking garage fires [M. Ahrens, *Structure and Vehicle Fires in General Vehicle Parking Garages*, NFPA, January 2006] represent less than 0.1% of the fire incidences.
- ○ A Parking Market Research Company (PMRC) study [D.F. Denda, *Parking Garage Fires (A Statistical Analysis of Parking Garage Fires in the United States: 1986-1988)*, Parking Market Research Company, April 1992] reached a similar conclusion on such low risk. That study looked at over 4,400 fire incidences for general vehicle parking including garages and surface lots with only 25% of these incidences in parking garages. During that same 3-year period approximately 7 million total fire incidences were reported. The parking garage fires for that 3-year period represent about 0.016% of the total fires.

The car park fire incident in the UK, with the significantly large number of vehicles becoming involved due to mitigating circumstances and design features contributing to fire spread, was an unusual event and is not a sufficient basis to support F110-18. The design practices and features of open parking structures in the US, which minimize fire spread between floors and reasonably withstand the structural impact from fire effects, have been shown to have an excellent record when it comes to fire incidences. Based on open parking garages having a very low risk from vehicle fires in the US, the mandate for sprinkler protection in the IFC is unwarranted.

Recommend DISAPPOVAL of F110-18

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction if F110-18 is approved it will increase the cost of construction of open parking garages. Disapproval will result in no increase in costs.

F110-18

F117-18

IFC: 903.3.1.2 (IBC[F] 903.3.1.2)

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing self (sdigiovanni@clarkcountynv.gov)

2018 International Fire Code

Revise as follows

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 13R where the Group R occupancy meets all of the following conditions:

1. Four stories or less above grade plane.
2. The floor level of the highest story is 30 feet (9114 mm) or less above the lowest level of fire department vehicle access.
3. The floor level of the lowest story is 30 feet (9114 mm) or less below the lowest level of fire department vehicle access.

~~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 grade plane.~~

Reason: The recent fires in Group R occupancies, both occupied and under construction, requires revisiting the applicable code requirements.

One major concern is the affect of the recent advent of podium-style buildings, and how the code has changed to allow NFPA 13R sprinkler systems to heights that exceed the original scope of NFPA 13R. The scope of NFPA 13R, 2007 edition, reads "This standard shall cover the design and installation of automatic sprinkler systems for protection against fire hazards in residential occupancies up to and including 4 stories in height". In 2013, the scope of NFPA 13R was changed to read "This standard shall cover the design and installation of automatic sprinkler systems for protection against fire in residential occupancies up to and including four stories in height in buildings not exceeding 60 feet (18 m) in height above grade plane."

This followed a change in the 2009 IBC that greatly expanded the use of the podium concept. After the expansion of the podium concept, the increase in height for NFPA 13R systems was permitted, leading us to where we are today. Today, 5 and 6 story height buildings can be created, where the separate podium building is one or two stories (measured from grade plane) and the other separate building, atop the podium building, is 4 stories as measured from the podium, all protected with NFPA 13R fire sprinklers.

There is a big difference in the protection provided between NFPA 13R and NFPA 13 systems, in the required design density and areas covered by fire sprinklers. Allowing the NFPA 13R sprinkler system for these taller podium style buildings leads to a significant decrease in the protection being provided by automatic fire sprinklers, versus what was required prior to the code changes referenced above.

When determining a suitable trigger for height to propose for this code section, a review of other parts of the code led to the requirements for when standpipe systems are required per Section 905.3.1. Philosophically, standpipe systems would be required where travel distance by responding fire fighters is long enough that hose lines fed directly from fire engines may not reach the fire, so that fire hose would need to be carried into the building, for connection to an outlet that is closer to the fire. The decision to trigger the requirement for a standpipe would represent a recognition of an increased building hazard, which in this can be adapted as a means to determine the break point between allowing a NFPA 13R sprinkler system, and requiring a NFPA 13 sprinkler system.

Cost-wise, the infrastructure, such as main pipe sizes, required to install a standpipe system, would ease the impact of requiring the sprinkler system to be NFPA 13, rather than NFPA 13R. While there would be significant argument that the pipe sizes would all have to be increased in order to change from NFPA 13R to NFPA 13, which would clearly increase costs, this increase is tempered by the fact that the pipe sizes required to comply with the standpipe system are so large that the NFPA 13 sprinkler design can very easily be accommodated with little to no increase in pipe sizing. In other words, by using the same requirement for when a standpipe system is required, the impact of requiring a NFPA 13 system, versus 13R, is substantially reduced.

For this reason, the proposal is to use the trigger for installation of a standpipe system, per existing Section 905.3.1, as the upper limit for permitting the installation of NFPA 13R systems, and by default creating the trigger for switching the sprinkler system to a NFPA 13 sprinkler system in Group R occupancies.

In summary, this proposal intends to address the recent fire history in Group R occupancies, especially those built with the podium concept, and seeks to increase the protection required in these buildings. The proposal utilizes the same trigger for requiring a standpipe system, for the point where the sprinkler system would have to change from NFPA 13R design, to NFPA 13 design. While there is still an increase in cost, this increase is greatly minimized due to the already existing requirement for standpipe systems.

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

This proposal will increase construction costs by requiring NFPA 13 sprinkler systems in some situations where NFPA 13R sprinkler systems are currently permitted. There is no doubt that, due to the difference in water flow required, additional sprinkler requirements, and other requirements in the NFPA standards, that the cost of NFPA 13 sprinkler systems is higher than the cost of NFPA 13R sprinkler systems. Some of this cost is mitigated by aligning the new requirement to the requirement for installing a standpipe system, which already would represent greater flow capacity for the building, ostensibly requiring larger diameter mains already; however, even with this mitigating factor, there is little doubt that this code change would represent an increase in overall construction costs.

F117-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. (Vote: 11-3)

Assembly Action:

None

F117-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Dan Buuck, representing National Association of Home Builders (dbuuck@nahb.org); Margo Thompson (mthompson@newportventures.net); John Catlett (jcatlett@boma.org); Jeffrey Hugo, National Fire Sprinkler Association (hugo@nfsa.org); Paula Cino (pcino@nmhc.org) requests As Modified by This Public Comment.

Modify as follows:

2018 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 above grade plane shall be permitted to be installed throughout in accordance with NFPA 13R ~~where the Group R occupancy meets all of the following conditions:~~

- ~~1. Four stories or less above grade plane.~~
- ~~2. The floor level of the highest story is 30 feet (9114 mm) or less above the lowest level of fire department vehicle access.~~
- ~~3. The floor level of the lowest story is 30 feet (9114 mm) or less below the lowest level of fire department vehicle access.~~

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 grade plane.

Commenter's Reason: Similar to the original proposal, this public comment limits the overall height of Group R occupancies to four stories above the grade plane, where current code allows up to four stories above the pedestal. This public comment differs from the proposal by removing the 30-foot maximum height allowance for NFPA 13R systems. As stated in the summary of the NFPA Life Safety Sprinkler System Workshop (<https://tinyurl.com/ybysd3wr>), there is no question that NFPA 13R systems have been effective. For that reason, it is unnecessary to lower the threshold for their use to 30 feet, which limits multifamily buildings to 3 stories above grade once the foundation is accounted for. With 66% of the multistory buildings constructed in 2017 being 3 stories or more (https://www.census.gov/construction/chars/pdf/mfb_floors.pdf), the proposal as originally written substantially increases cost for the multifamily building industry.

The 30-foot height limit for requiring a NFPA 13R fire sprinkler system in the original proposal was chosen to correlate with the requirement for standpipes in Section 905.3.1. However, correlating the threshold of 30 feet to the topmost floor starts the requirement for standpipes but it stops the application of NFPA 13R. This means a four-story building over 30 feet would have a standpipe and a NFPA 13 system. While there are potentially increased pipe sizes for the combined standpipe and the NFPA 13 sprinkler system, as explained below *, a manual wet standpipe is permitted for four story buildings. Adding a NFPA 13 system with the standpipe at the fourth floor requires more flow and pressure to the sprinkler system, meaning, in most cases, it adds a standalone fire pump to supply the sprinkler system demand, negating the benefit of having the manual wet standpipe option.

National Multifamily Housing Members estimate that moving from 13R to 13 sprinkler systems would carry an incremental installed cost increase of approximately \$1.00/sq. ft. \$2.00/sq. ft. of overall building area on average across the US. This does not include final cost with markup to the building owner or adding a fire pump to the NFPA 13 system. Greater density and spacing of sprinklers, larger pipe diameter, sprinklers in concealed spaces, and especially, requirements for attic protection (with some exceptions) all contribute to the added cost. Costs associated with requirements for attic protection in 13 systems not only includes the additional sprinklers and piping but also costs associated with increased

hydraulic demand and water supply as well as necessary freeze protection in cold and even moderate climates. Price quotes and completed projects have shown that installing a NFPA 13 system can add approximately 50% to the cost compared to a NFPA 13R system. The extent of these costs are dependent upon regulatory costs, size of the system, available water supply, whether a fire pump is required, etc.

* A four-story residential occupancy protected by a NFPA 13R system also is required to have a Class I standpipe system (IFC 905.3.1). A Class I standpipe can be of several types, such as automatic dry or wet and manual dry or wet (NFPA 14: 5.4.1.1). Typically in a sprinklered building with a standpipe, the systems are combined (NFPA 14: 3.3.15.3 and 7.10.1.3), this means the above ground pipe is used for both purposes: to serve as a single pipe system in stairways to serve standpipe hose connections and to serve the floor fire sprinkler system. A combined sprinkler/standpipe system contains water at all times, but when the manual wet standpipe (NFPA 14: 3.3.15.5) is combined with the sprinkler system, it only has the system demand (flow and pressure) to serve the sprinkler system. The standpipe system demand (flow and pressure) is supplied by the fire department through the fire department connection to serve the standpipe hose outlets. In other words, there is enough flow and pressure from the municipal water supply to provide the sprinkler system demand (NFPA 14: 3.3.18), but not the standpipe system. The standpipe pressure is provided by the fire department during a fire. What is the purpose for using a wet manual systems? It eliminates the need for a fire pump to serve the standpipe only, since the fire department only uses the Class I hose connections, the fire department is allowed per NFPA 14 to provide the pressure. NFPA 14 allows manual wet systems to serve low-and mid-rise buildings but not high-rises. Since this proposal only allows four-stories from grade plane and Chapter 5 doesn't allow any building using NFPA 13R to be over 60 feet in height, there is no potential for misapplication. In fact, the manual wet standpipe combined with the sprinkler system has been allowed by the codes for many years and is typical for most new four-story residential construction.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This public comment will increase construction costs compared to current code by requiring NFPA 13 sprinkler systems in pedestal buildings where NFPA 13R sprinkler systems are currently permitted. However, it will lessen the cost impact to overall construction, including four-story residential buildings, compared to the original proposal. It is estimated that moving from a NFPA 13R to a NFPA 13 sprinkler system would carry an incremental installed cost increase of approximately \$1.00/sq. ft. - \$2.00/sq. ft. of overall building area on average across the US.

Public Comment 2:

Proponent: Tien Peng, representing National Ready Mixed Concrete Association (tpeng@nrmca.org) requests As Submitted.

Commenter's Reason: Under **903.3.1.2 NFPA 13R sprinkler systems**. *Automatic sprinkler systems* in Group R occupancies up to and including **four stories** in height shall be permitted to be installed throughout in accordance with NFPA 13R.

The number of stories used in determining the minimum type of construction for buildings, including pedestal or podium construction should be measured from **the grade plane or lowest level of fire department access** per this proposal to meet the intent of the NFPA sprinkler system designed per 903.3.1.2 for R Occupancies. The trade-off allowing for the number of stories to be counted from the podium continues the increased fire risks and community costs. Examples such as Edgewater, NJ, DaVinci, Los Angeles, College Park, MD, Montrose Fire, Houston, TX all point to the increase risks.

Bibliography: N/A

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. Code should be revised in favor of occupant safety even if there is a slight increase in construction costs.

Public Comment 3:

Proponent: Ken Brouillette, City of Seattle Fire Department, representing Seattle Fire Department (ken.brouillette@seattle.gov); Jonathan Siu, City of Seattle Department of Construction and Inspections (jon.siu@seattle.gov) requests Disapprove.

Commenter's Reason:

Brouillette: The appropriate use of NFPA 13R should continue to be developed through the NFPA process and not by ICC. NFPA 13R states, NFPA 13R is appropriate for use as an alternative to NFPA 13 only in those residential occupancies, as defined in this standard, up to and including four aboveground stories in height. It should be noted that model building codes contain special allowances for pedestal or podium-style buildings, which permit the story height for structures above the pedestal to be measured from the top surface of the pedestal, rather than from grade plane, and it is the intent of NFPA 13R to follow this model building code method for determining the number of stories. Accordingly, it is possible for a four-story residential structure to be within the scope of NFPA 13R even when that structure is constructed

on top of a one-story pedestal. However, where this is allowed, model building codes will require the pedestal portion to be constructed using Type I construction, and the pedestal portion will be required to be protected by an NFPA 13 compliant sprinkler system.

NFPA 13R also indicates that the standard is limited to buildings that are 60 ft (18 m) or less in height above grade plane.

The current code language in the 2018 IFC is consistent with the scope of NFPA 13R and should not be changed unless the standard itself has been changed through NFPA .

This code change requirement would be too restrictive as it removes the current allowance for buildings up to 60 feet in height measured from grade plane.

Siu: Our objection to this proposal is that by measuring to lowest fire department vehicle access, it penalizes buildings built on downsloping corner lots. Figure 1 below depicts two identical buildings built side-by-side, fronting on a level street (site plan). Both lots have identical slopes downward from the street (west elevation). Building 2 is built mid-block; Building 1 is built on a street corner. Because lowest fire department vehicle access for the Building 1 is measured from the sloping side street, its measurement datum is lower than the mid-block building, which is measured from the fronting street. Based on the measurements shown in the figure, this proposal would trigger a full NFPA 13 system for the Building 1 whereas the Building 2 could use an NFPA 13-R system, yet in all ways except location, the buildings are identical. Note that it can be argued that Building 1 has better fire department access (two sides) than Building 2. It seems that if Building 2 is considered to be safe, the Building 1 should not be penalized for its corner location.

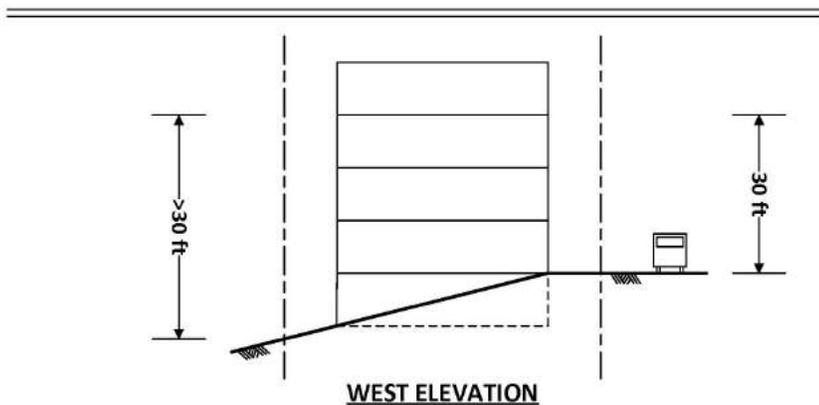
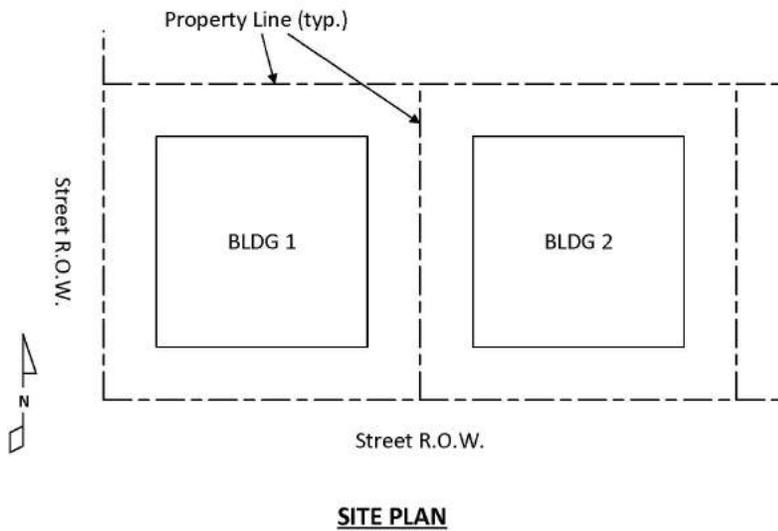


FIG. 1 – F117-18 – CORNER VS MID-BLOCK LOT

Bibliography:

NFPA 13R 2019 Edition (Appendix) (Section A1.1)

A.1.1 NFPA 13R is appropriate for use as an alternative to NFPA 13 only in those residential occupancies, as defined in this standard, up to and including four aboveground stories in height. It should be noted that model building codes contain special allowances for pedestal or podium-style buildings, which permit the story height for structures above the pedestal to be measured from the top surface of the pedestal, rather than from grade plane, and it is the intent of NFPA 13R to follow this model building code method for determining the number of stories. Accordingly, it is possible for a four-story residential structure to be within the scope of NFPA 13R even when that structure is constructed on top of a one-story pedestal.

However, where this is allowed, model building codes will require the pedestal portion to be constructed using Type I construction, and the pedestal portion will be required to be protected by an NFPA 13 compliant sprinkler system.

Regardless of whether a building does or does not involve a pedestal, NFPA 13R systems are always limited to structures that

do not exceed 60 ft (18 m) in height above grade plane. Note that model building codes do not allow building height to be measured from the top of a pedestal. That allowance only applies to determining the number of stories. The 60 ft (18 m) overall height limit is consistent with limits established by model building codes for buildings of Type V construction.

The height of a structure above grade plane is determined by model building codes, which base the height on the average

height of the highest roof surface above grade plane. For further information on the building height story limits, see model building codes.

NFPA 13R 2019 Edition Section 1.1 Scope

1.1* Scope. This standard shall cover the design and installation of automatic sprinkler systems for protection against fire hazards in residential occupancies up to and including four stories in height that are located in buildings not exceeding 60 ft (18 m) in height above grade plane.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. Based on the original proponents cost impact statement and if F117-18 is disapproved, then a cost savings would occur by not having to install a NFPA 13 automatic fire sprinkler system and maintaining code compliance with a NFPA 13R system.

F117-18

F126-18

IFC: 905.3.1 (IBC: [F] 905.3.1)

Proposed Change as Submitted

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

2018 International Fire Code

Revise as follows

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where any of the following conditions exist:

1. Four or more stories are above or below grade plane.
2. 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.
3. 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.~~ parking garages.
4. ~~Class I manual~~ Semi-automatic 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.~~ temperatures.

Reason: The purpose of this change is to modify the two exceptions addressing standpipe system installed in open parking garages. The exceptions have been in the IFC/IBC unchanged since the 2000 editions of the codes while the materials in vehicles has changed to add more combustible synthetic material, thinner/lighter metals and a growing increase of alternative fueled vehicles, GH2, CNG, LPG and Lithium-Ion batteries. Electric Vehicle charging stations have been installed within parking garages to encourage their use. Basically, the current requirements for parking garages, open or closed, in the codes are based on old vehicle concepts and studies.

Multi-vehicle large fires can occur and have occurred. As in any multi-story building, effective firefighting actions to protect life and property involved being able to quickly apply water to the fire. The type of fire and danger presented by that fire has increased as the use of alternative fueled vehicles has increased.`

This proposal deletes the options for manual standpipes which as a rule require extra effort on the part of the fire service to get water to upper stories and attempt extinguishment of the fire. In place is allowance for Class I standpipes to be installed an any parking garage. The standpipes are there for firefighter use, in the rare occurrence a parking garage opts to have trained personnel they can add the necessary outlet reducer and hose line.

The proposal also calls for semi-automatic dry systems where subject to freezing temperatures. As part of that change the Class II location requirement was eliminated.

NFPA 14 2016 edition

3.3.17.6 Semiautomatic Dry Standpipe System. *A standpipe system permanently attached to a water supply that is capable of supplying the system demand at all times arranged through the use of a device such as a deluge valve and that requires activation of a remote control device to provide water at hose connections.*

Neither the height of the story the fire is located on or the temperature of the atmosphere impacts the size of the fire and amount of water needed to be rapidly applied. The standpipe systems should meet all the requirements for a semi-automatic dry system which will provide for a more rapid water supply availability.

The fuel loads have changed significantly in parking garages due to modern manufacturing methods and the increased use of alternative fuels. Improvement in the requirements of the codes is necessary to address those changes.

Background material.

<http://www.urbanfiretraining.com/parking-garages.html>

<http://www.firerescuemagazine.com/articles/print/volume-7/issue-2/strategy-and-tactics/fighting-vehicle-fires-in-parking-garages.html>

<http://www.fireengineering.com/ap-news/2018/01/01/parking-garage-fire-destroys-hundreds-of-cars-in-uk.html>

<https://www.youtube.com/watch?v=KVx6avRTNCA>

<https://www.youtube.com/watch?v=HK0U-PKJ1NE>

Cost Impact: The code change proposal will increase the cost of construction. This proposal will increase costs but is balanced with allowance for Class I standpipes in all parking garages and by eliminating the Class II outlet location requirements. The nature of the fuel load has changed within parking structures and fire protection systems need to be improved to deal with the potential fires.

F126-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. (Vote: 14-0)

Assembly Action:

None

F126-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Daniel E Nichols, representing MTA Metro-North Railroad (rotoray@optonline.net) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where any of the following conditions exist:

1. Four or more stories are above or below grade plane.
2. 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.
3. 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 standpipes are allowed in parking garages.
4. ~~Semi-automatic dry standpipes are allowed in open parking garages that are subject to freezing temperatures.~~

Commenter's Reason: IFC 905.3.1 exceptions deal with the Class of standpipes. The original proposal removes the Class I exception for open parking structures when it added in semiautomatic dry, requiring a Class III standpipe in open parking structures. There is no substantiation of why occupant hose stations need to be placed in open parking structures. NFPA 14-2016 does not exempt Class II occupant use hose when a system is semiautomatic dry; Section 5.4.2 states that a semiautomatic dry can be used with a Class II or Class III system.

Besides the reasons for the removal of all occupant use hose in all Group B and E occupancies in the last cycle, the placement of occupant use hose in open parking garages would be an attraction to vandals in an area known for tampering (see reasons for standpipe cap protections) and would be outside the intent of incipient fire control (see reason statement and support for F110-18).

IFC 905.8 already discusses when dry standpipes can and cannot be used; as well as directing the code user to NFPA 14 to select appropriate types of standpipe systems to address the issues. There is no substantiation of why semiautomatic-dry systems need to be added to only open parking structures. The addition of semiautomatic dry will require a suitable water supply, backflow prevention, electronic monitoring, and provisions for heat (in colder climates). The 2018 IFC would allow for manual standpipes, which can be supplied from a fire department pumper attached to a hydrant within 100 feet of the fire department connection.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This removes the semiautomatic dry requirement and returns to permitted language used in 905.3.1 and 905.8.

F126-18

F128-18

IFC: 905.9 (IBC: [F] 905.9)

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

905.9 Valve supervision. Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes ~~provided by the municipality or public utility~~ do not require supervision.
2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.
3. Control valves and isolation valves for dry manual standpipes are permitted to be locked in the open position.

Reason: In Exception 1, the removal of the supervision requirement for municipal or public utility roadboxes correlates to a similar proposal made to IFC/IBC 903.4. NFPA 24, referenced by the IFC does not require supervision of private main roadboxes. By removing this text, it would apply to be public and private mains.

In Exception 3, the fire department is the water supply for dry manual standpipe systems. Section 5.6.1 of NFPA 14 specifically states electrical supervision for the control valve in a dry manual standpipe system is not required. This may seem to contradict Section 6.3.7.1 of NFPA 14, but a dry manual standpipe system is not connected to an automatic system water supply. Dry manual standpipes are supplied by the fire department and the valve position is controlled by the fire department. Locking the control valve (if provided) for the dry manual system in the open position insures uninterrupted operation when the system is pressurized.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

This proposal clarifies which valves are required to be electrically supervised and which valves are permitted to be locked. This will provide consistency in the market and eliminate alternate interpretations of the code.

F128-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that there are situations where the proposed exception would not be acceptable. The specific example given was a large building under construction that has commingled parts of the building that have dry or wet standpipes that are used as manual means for fire fighting that would need to be electrically supervised. (Vote: 8-7)

Assembly Action:

None

F128-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Stephen DiGiovanni, representing FCAC (sdigiovanni@clarkcountynv.gov); Jeffrey Hugo (hugo@nfsa.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

905.9 Valve supervision. Valves controlling water supplies shall be supervised in the open position so that a change in the normal position of the valve will generate a supervisory signal at the supervising station required by Section 903.4. Where a fire alarm system is provided, a signal shall be transmitted to the control unit.

Exceptions:

1. Valves to underground key or hub valves in roadway boxes do not require supervision.
2. Valves locked in the normal position and inspected as provided in this code in buildings not equipped with a fire alarm system.
3. ~~Control valves and isolation valves for dry manual standpipes are permitted to be locked in the open position.~~

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This proposal originally contained two changes. One change is to revise Exception 1 to no longer qualify the exception only for underground valves that are provided by the public entity This change correlates to another FCAC proposal, F123-18, which was approved by the Fire Code Committee. F123-18 was developed to address the challenges with enforcing the requirement for valve supervision for underground valves on private property. This change to address underground valve supervision is being retained in this public comment.

The second change in the original proposal was to add a third exception to allow valves for dry manual standpipe to be locked, instead of supervised. This part of the proposal received considerable feedback from the Fire Code Committee, and ultimately the original proposal was denied. Please note that this public comment no longer proposes this new exception 3.

As such, this public comment is provided to continue the part of the original proposal that correlates to F123-18, which was approved by the committee, while dropping the third exception proposal, which clearly was not supported by the Fire Code Committee.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The code section is not enforceable, so it is assumed that few if any are actually installing the monitoring on underground valves. For those that currently do install the monitoring, this change will decrease the cost of construction.

F128-18

F132-18

IFC: 906.1 (IBC: [F] 906.1)

Proposed Change as Submitted

Proponent: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (richard.kluge@ericsson.com)

2018 International Fire Code

Revise as follows

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exceptions:

1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception: Portable fire extinguishers are not required at normally unmanned buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

Reason: The IFC section 906 Commentary repeatedly discusses the use of Portable Fire Extinguishers for incipient fire control to allow for increased time for evacuation, but these benefits are not applicable to unmanned locations. US telecommunication carriers operate a large number of small unmanned equipment facilities. It is not practical to install and maintain Portable Fire Extinguishers in accordance with NFPA 10 at normally unmanned locations as explained below.

Backup generators at remote telecommunications locations provide telecommunications services when commercial ac power fails. These sites may have diesel fuel or liquified propane gas (LPG) stored either indoors or outdoors. Fuel oil, when used, is typically less than 660 gallons in capacity. The sites are normally unmanned. Technicians will travel to the sites only when needed for repairs or maintenance activities. These sites are considered Utility and Miscellaneous Group U occupancies under the IBC. Adherence to the current Section 906 of the IFC requires keeping an extinguisher at the site in compliance with NFPA 10. This requires monthly inspections. For rarely visited remote locations, compliance to NFPA 10 entails a monthly visit for the sole purpose of inspecting the extinguisher, which while possible, is not reasonable. Certain remote and isolated locations are not accessible or impractical to visit during winter months as access is blocked by snow. Furthermore, if there were a fire, the vast majority of the time, there is no one on site to use the extinguisher as the site is not manned. Having a Portable Fire Extinguisher on the technician's vehicle when servicing the site is a more effective alternative to a fixed site-mounted extinguisher. The Portable Fire Extinguisher carried on the vehicle can be inspected and maintained per NFPA 10 and ready for use if necessary.

From the International Building Code Commentary

Per IBC Section 312, Utility and Miscellaneous Group U Commentary: "Structures housing accessory equipment that is part of a utility or communications system are often classified as Group U occupancies when there is no intent that these structures be occupied except for serving and maintaining the equipment within the structure." This language supports an exemption to clearly state the Portable Fire Extinguishers are not required in unmanned or unoccupied Group U structures when visiting personnel have extinguishers available.

Related content from NFPA 76, Standard for Fire Protection of Telecommunications Facilities

NFPA 76, Chapter 11, "Small Unoccupied Structures" applies to small normally unoccupied telecommunications sites including on-grade walk-in cabinets, on-grade huts, cell huts, and controlled environmental vaults. Section 11.2.3 clearly states that portable fire extinguishers shall not be required in these facilities.

Related content from CFR, Subchapter N, Artificial Islands and Fixed Structures on the Outer Continental Shelf

Code of Federal Regulations of the United States of America, Subchapter N, Artificial Islands and Fixed Structures on the Outer Continental Shelf, Part 145 Fire-Fighting Equipment also supports the position that fire extinguishers in unmanned locations are not required. Per the CFR, Subchapter N, Artificial Islands and Fixed Structures on the Outer Continental Shelf, Part 14, fire extinguishers are only required when crews will be working at the site on a 24-hour basis. Continual deployment of Portable Fire Extinguishers at unmanned locations provides no value and is not practical.

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

The cost of code compliance will decrease if portable fire extinguishers will not be required to be installed and maintained at unmanned locations.

F132-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that: the language needed improvement to be clear, it is in the wrong location, it should focus on Group U telecommunication facilities, needs "where approved" added and it should address other Group U occupancies. (Vote: 14-0)

Assembly Action:

None

F132-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Richard Kluge, Ericsson Inc., representing Alliance for Telecommunications Industry Solutions (richard.kluge@ericsson.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

Exception: Portable fire extinguishers are not required in unoccupied Group U communication equipment structures.

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exceptions:

1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

~~**Exception:** Portable fire extinguishers are not required at normally unmanned buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.~~

Commenter's Reason: As drafted, the original proposal was not approved by the committee, which questioned its inclusion in the charging statement. After considering several alternative locations for the exception language, such as placing it after item 3 alone, and in two locations after items 3 and 6, it was determined that before item 1 is the logical location for the exception.

There was a suggestion by one committee member to include "where approved" but this text does not seem warranted when the code is the minimum set of requirements for unoccupied facilities. The AHJ can always request a PFE at a group U communications facility if it is deemed necessary, but this would never be the norm.

The committee feedback was divided on whether the exception should be applicable to other utilities. The text proposed focuses on Group U communication facilities and aligns with the IBC wording for such structures.

Bibliography:

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. The cost of code compliance will decrease if portable fire extinguishers will not be required to be installed and maintained at unoccupied locations.

Public Comment 2:

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exceptions:

1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
3. In areas where flammable or combustible liquids are stored, used or dispensed.
4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1.
5. Where required by the sections indicated in Table 906.1.
6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

Exception: Portable fire extinguishers are not required at normally unmanned Group U occupancy buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.

Commenter's Reason: The revised language clearly identifies that this exception is for Group U facilities only.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

This public comment provides a clarification on an exception and will not have any impact on the cost of construction.

Public Comment 3:

Proponent: randy schubert, Ericsson, representing ATIS (randy.schubert@ericsson.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

906.1 Where required. Portable fire extinguishers shall be installed in all of the following locations:

1. In new and existing Group A, B, E, F, H, I, M, R-1, R-2, R-4 and S occupancies.

Exceptions:

1. In Group R-2 occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each dwelling unit is provided with a portable fire extinguisher having a minimum rating of 1-A:10-B:C.
 2. In Group E occupancies, portable fire extinguishers shall be required only in locations specified in Items 2 through 6 where each classroom is provided with a portable fire extinguisher having a minimum rating of 2-A:20-B:C.
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment and from domestic cooking equipment in Group I-1; I-2, Condition 1; and R-2 college dormitory occupancies.
 3. In areas where flammable or combustible liquids are stored, used or dispensed.

Exception: Portable fire extinguishers are not required in unoccupied Group U communication equipment structures.

4. On each floor of structures under construction, except Group R-3 occupancies, in accordance with Section 3315.1.
5. Where required by the sections indicated in Table 906.1.

Exception: Portable fire extinguishers are not required in unoccupied Group U communication equipment structures.

6. Special-hazard areas, including but not limited to laboratories, computer rooms and generator rooms, where required by the *fire code official*.

~~**Exception:** Portable fire extinguishers are not required at normally unmanned buildings or structures where a portable fire extinguisher suitable to the hazard of the location is provided on the vehicle of visiting personnel.~~

Commenter's Reason: As drafted, the original proposal was not approved by the committee, which questioned its inclusion in the charging statement. After considering several alternative locations for the exception language, the most applicable locations are placing the statement after items 3 and 5. There was a suggestion by one committee member to include "where approved" but this text does not seem warranted when the code is the minimum set of requirements for unoccupied facilities. The AHJ can always request a PFE at a group U communications facility if it is deemed necessary, but this would never be the norm.

The committee feedback was divided on whether the exception should be applicable to other utilities. The text proposed focuses on Group U communication facilities and aligns with the IBC wording for such structures.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposed exception does not impact construction cost.

F132-18

F138-18

IFC: 907.2.3, 907.2.3.1 (New), 907.2.3.2 (New) (IBC: [F] 907.2.3, [F]907.2.3.1 (New), [F]907.2.3.2 (New))

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Michael Pallett, Telecor Inc., representing Telecor Incorporated (mpallett@telecor.com)

2018 International Fire Code

Delete and substitute as follows

~~**907.2.3 Group E.** A manual fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. Where *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.~~

Exceptions:

- ~~1. A manual fire alarm system is not required in Group E occupancies with an *occupant load* of 50 or less.~~
- ~~2. Emergency voice/alarm communication systems meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall not be required in Group E occupancies with occupant loads of 100 or less, provided that activation of the manual fire alarm system initiates an *approved* occupant notification signal in accordance with Section 907.5.~~
- ~~3. Manual fire alarm boxes are not required in Group E occupancies where all of the following apply:
 - ~~3.1. Interior corridors are protected by smoke detectors.~~
 - ~~3.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by *heat detectors* or other *approved* detection devices.~~
 - ~~3.3. Shops and laboratories involving dusts or vapors are protected by *heat detectors* or other *approved* detection devices.~~~~
- ~~4. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
 - ~~4.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1.~~
 - ~~4.2. The emergency voice/alarm communication system will activate on sprinkler water flow.~~
 - ~~4.3. Manual activation is provided from a normally occupied location.~~~~

~~**907.2.3 Group E.** A manual fire alarm system shall be installed in Group E occupancies with an occupant load greater than 50. Where an automatic sprinkler system or a smoke detector system is installed, such systems shall be connected to the building fire alarm system.~~

Add new text as follows

907.2.3.1 Manual fire alarm boxes. Manual fire alarm boxes shall be provided unless either of the following applies:

1. Interior corridors are protected by smoke detectors; auditoriums, cafeterias, gymnasiums and similar areas are protected by heat detectors or other approved detection devices; and shops and laboratories involving dusts or vapors are protected by heat detectors or other approved detection devices.
2. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with Section 903.3.1.1, and occupant notification will activate upon sprinkler waterflow, with manual activation provided at a normally occupied location.

907.2.3.2 Occupant notification. Where the occupant load of the Group E occupancy is greater than 100, the fire alarm system shall initiate one of the following:

1. An occupant notification signal utilizing an emergency voice/alarm communications system complying with Sections 907.5.2.2 and 907.6.
2. An occupant notification signal complying with Section 907.5 and an interconnected in-building mass notification system complying with Sections 907.5.2.2 and installed in accordance with Section 907.6, and NFPA 72.

Reason: Changes proposed for 907.2.3 are intended to:

- a) improve code language clarity by eliminating complex lists of exceptions;

b) permit listed mass notification systems in conjunction with fire alarm systems as an alternative to EVAC for occupant notification.

In North America, the risk of death and serious injury in schools has shifted from fire incidences towards incidences of violence through a combination of reduction of fire deaths and an increase of violence. NFPA 72 2010 formally introduced listed (UL 2572) mass notification systems as an enforceable class of emergency communication system (ECS). Mass notification often utilizes both voice and textual notification and is intended to communicate information about emergencies including but not limited to: fire, human caused events (accidental and intentional), other dangerous situations, accidents, and natural disasters.

As threats to children in schools evolve, in-building mass notification systems (MNS) have and are being professionally developed specifically for educational occupancies. MNS are designed to support multiple situations including: environmental, active shooter, hostage, and weather. MNS may include automatic responses such as: lockdown, partial lockdown with partial evacuation, lockdown acknowledgment and tracking, lockout, reverse evacuation, covert monitoring, and others. EVAC systems do not require a risk analysis because the risk of fire in schools is generally well understood. But MNS (as per NFPA 72) does require formal consideration of the risks above by requiring a specific risk analysis be developed for each school.

This proposal provides an option for listed mass notification systems in combination with fire alarm systems as an alternative to EVAC systems in schools. The relationship between fire alarm and in-building mass notification is well-developed in NFPA 72. Some schools are budget limited and cannot support the purchase of both EVAC and MNS. This proposal is intended to provide choice for jurisdictions considering MNS as an option.

The proposed code includes safeguards to ensure the level of protection of the school is not reduced as compared with EVAC. References to NFPA 72 ensure that MNS systems are listed to UL 2572 or UL 864. Both NFPA 72 and UL 2572 require that listed MNS systems are manufactured to common core F.A. standards including: secondary power, monitoring for integrity, supervisory, trouble, emergency control functions, notification and control circuits, annunciation and zoning, pathway class designation, monitoring for integrity and circuit performance, audible characteristics, system performance and integrity, performance of initiating device circuits (IDCs), notification appliance circuits (NACs), and signaling line circuits (SLCs).

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. There is no cost impact, because the proposal presents MNS/fire alarm as an option, not a requirement. The restructuring of the paragraph maintains the current requirements so there is no additional cost associated with these changes.

When MNS/fire alarm is chosen, there is the additional cost of the MNS system, but also cost reductions from changing EVAC to manual fire alarm and the elimination of P.A. systems that are normally installed in schools.

F138-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had concern with the proposed new Section 907.2.3.1 not having a reference to the existing Section 907.2 regarding the requirement to provide not fewer than one manual fire alarm box. Additionally it was noted that the format is cumbersome, hard to read and needs more refinement. (Vote: 14-0)

Assembly Action:

None

F138-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael Pallett, representing Telecor Incorporated (mpallett@telecor.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

907.2.3 Group E. A manual fire alarm system that initiates the occupant notification signal utilizing an emergency voice/alarm communication system meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall be installed in Group E occupancies. Where *automatic sprinkler systems* or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system.

Exceptions:

1. A manual fire alarm system is not required in Group E occupancies with an *occupant load* of 50 or less.
2. Emergency voice/alarm communication systems meeting the requirements of Section 907.5.2.2 and installed in accordance with Section 907.6 shall not be required in Group E occupancies with occupant loads of 100 or less, provided that activation of the manual fire alarm system initiates an *approved* occupant notification signal in accordance with Section 907.5.
3. Manual fire alarm boxes ~~are~~ shall not be required in Group E occupancies where all of the following apply:
 - 3.1. Interior *corridors* are protected by smoke detectors.
 - 3.2. Auditoriums, cafeterias, gymnasiums and similar areas are protected by *heat detectors* or other *approved* detection devices.
 - 3.3. Shops and laboratories involving dusts or vapors are protected by *heat detectors* or other *approved* detection devices.
 - 3.4. Manual activation is provided from a normally occupied location.
4. Manual fire alarm boxes shall not be required in Group E occupancies where all of the following apply:
 - 4.1. The building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1.
 - 4.2. The emergency voice/alarm communication system will activate on sprinkler water flow.
 - 4.3. Manual activation is provided from a normally occupied location.
5. In lieu of utilizing an emergency voice/alarm communications system, a listed in-building mass notification system, interconnected in conjunction with a fire alarm system is permitted where all the following apply:
 - 5.1 The fire alarm system and in-building mass notification system are integrated such that their joint operations and capabilities also comply with the emergency voice/alarm communications system requirements of Section 907.5.2.2.
 - 5.2 The in-building mass notification system is installed to the same standards as the fire alarm system in accordance with Section 907.6, and NFPA 72.
 - 5.3 The in-building mass notification system equipment and components are listed to UL 2572 or UL 864.

Commenter's Reason: This public comment is to revise F138-18 according to ICC Committee Action Hearing (CAH), Fire Code Action Committee (FCAC), and AFAA feedback.

F138-18 is important in the recognition of the unified effort it takes to respond to an Active Shooter Event in our K-12 schools. The response goes beyond the Fire Service, involving Police, EMS, local security (often former police), and importantly - school staff.

According to The Police Response to Active Shooter Incidents Published March 2014 by the Police Executive Research Forum:

Remember that on average, it takes police three minutes to arrive on the scene, and another few minutes to locate and stop the shooters. So for at least the first few minutes of an attack, the potential victims are on their own. The major message that we have for civilians is, You are not helpless. What you do matters. And what you do can save your own life and the lives of others. Our research found that many times, active-shooter attacks stopped because potential victims took action to stop the shooter directly, or they made it more difficult for the shooter to find targets.

The IFC 2018 added section 917 Mass Notification Systems, but only for Colleges and Universities. This is as big an issue for K-12 schools as it is for Colleges and Universities. Not only is the population of K-12 more vulnerable, but of the top 8 worst school/collage/university shootings with 10 deaths or more as of June 2018: 5 of 8 were K-12 schools accounting for 77 deaths; Colleges and Universities accounted for 60 deaths. Out of the 24 worst, 13 are K-12 schools.

Fire Emergency Voice Alarm Communication Systems (EVAC) provides only so much support for the first responders, and relatively little support for school administrative staff. Whenever one of these tragedies occurs, a common denominator is that the school staff is always present, and always respond first. Technology is already being deployed to provide functionality such as real time lockdown reporting, emergency covert listening and two-way individual room communications, emergency call buttons, panic buttons, geofenced wireless alerting, and comprehensive remote access. School districts and states are already working with police services to incorporate new emerging technologies into their response plans. Some of these technologies are already required by IFC 2018 in section 404.2.3 Lockdown Plans.

Emerging technologies are being used in response to emergency situations. By specifically requiring a UL 2572/864 listing and NFPA 72 compliance for all emergency communications used in our K-12 schools, F138 will require at a minimum, in-building mass notification technologies used in our schools to be designed, deployed, and maintained to the same level of reliability as other emergency communication equipment such as EVAC.

Bibliography: CRITICAL ISSUES IN POLICING SERIES

The Police Response to Active Shooter Incidents

March 2014

POLICE EXECUTIVE RESEARCH FORUM

http://www.policeforum.org/assets/docs/Critical_Issues_Series/the%20police%20response%20to%20active%20shooter%20

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There was no change to the cost associated with F138-18 due to this public comment. F138-18 does not represent a cost increase because the changes are presented as an option for building officials, rather than a new requirement.

F138-18

F144-18

IFC: 907.4, 907.5, 907.5.1 (New), 907.5.1.1, 907.5.2.1.3 (New), 907.5.2.1.3.1 (New), 907.5.2.1.3.2 (New) (IBC: [F] 907.4, [F]907.5, [F]907.5.1 (New), [F]907.5.1.1, [F]907.5.2.1.3 (New), [F]907.5.2.1.3.1 (New), [F]907.5.2.1.3.2 (New))

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

907.4 Initiating devices. ~~Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating a fire alarm system is required by another section of this code, occupant notification in accordance with Section 907.5 shall be initiated by one or more of the following. Initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.~~

1. Manual fire alarm boxes.
2. Automatic fire detectors.
3. Automatic sprinkler system waterflow devices.
4. Automatic fire-extinguishing systems.

907.5 Occupant notification systems, notification. ~~A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation. Occupant notification by fire alarms shall be in accordance with Sections 907.5.1 through 907.5.2.3.3. Where a fire alarm system is required by another section of this code, it shall be activated by:~~

1. ~~Automatic fire detectors.~~
2. ~~Automatic sprinkler system waterflow devices.~~
3. ~~Manual fire alarm boxes.~~
4. ~~Automatic fire-extinguishing systems.~~

Exception: ~~Where notification systems are allowed elsewhere in Section 907 to annunciate at a constantly attended location.~~

~~907.5.2.3.3. Occupant notification by smoke alarms in Groups R-1 and R-2 Occupancies shall comply with Section 907.5.2.1.3.2.~~

Add new text as follows

907.5.1 Alarm activation and annunciation. Upon activation, fire alarm systems shall initiate occupant notification and shall annunciate at the fire alarm control unit, or where allowed elsewhere in Section 907, at a constantly attended location.

907.5.1.1 Presignal feature. ~~A presignal feature shall not only be installed unless provided where approved by the fire code official. Where a presignal feature is provided, a signal approved. The presignal shall be annunciated at an approved at a constantly attended location approved by the fire code official, so that occupant notification can be activated in~~ having the capability to activate the occupant notification system in the event of fire or other emergency.

907.5.2.1.3 Audible signal frequency in Groups R-1 and R-2 sleeping rooms. Audible signal frequency in Groups R-1 and R-2 occupancies shall be in accordance with Sections 907.5.2.1.3.1 and 907.2.1.3.2.

907.5.2.1.3.1 Fire alarm system signal. In sleeping rooms of Groups R-1 and R-2 Occupancies, the audible alarm activated by a fire alarm system shall be a 520 Hz low-frequency signal complying NFPA 72.

907.5.2.1.3.2 Smoke alarm signal in sleeping rooms. In sleeping rooms of Groups R-1 and R-2 Occupancies that are required by Sections 907.2.8 or 907.2.9 to have a fire alarm system, the audible alarm signal activated by single- or multiple-station smoke alarms in the dwelling unit or sleeping unit shall be a 520 Hz signal complying NFPA 72.

Where a sleeping room smoke alarm is unable to produce a 520 Hz signal, the 520 Hz alarm signal shall be provided by a listed notification appliance or a smoke detector with an integral 520 Hz sounder.

Reason: This Proposal seeks to enhance the waking effectiveness of high risk segments of the population in the

International Fire Code (IFC) by requiring a consistent use of the 520 Hz low frequency audible fire alarm signal in new Group R-1 and R-2 occupancies that are required to have a fire alarm system.

This approach is an interim option to get the low frequency signal in buildings where the technology is commercially available and avoids requiring the low frequency signal in buildings where the technology is not currently available in the stream of commerce. The proposal has taken careful consideration to not require the low frequency technology in buildings without a fire alarm system because there are no smoke alarms currently available with an integral sounder capable of producing the low frequency signal. However, it does not prohibit their installation if the product becomes available in the future. The reason the proposal does require the low frequency signal in sleeping areas of buildings with a fire alarm system because there are numerous manufacturers of system connected smoke detectors with an integral sounder that produces the 520 Hz low frequency signal.

Peer-reviewed research has concluded the 520 Hz low frequency is six times more effective than the standard 3 KHz signal at waking high risk segments of the population (people over 65, people who are hard of hearing, school age children and people who are alcohol impaired). The standard 3 KHz audible alarm signal has been used in the majority of fire alarm horns and smoke alarms for the past 30 years.

The reason this Proposal is necessary is because NFPA 72 stipulates both the 520 Hz and 3 KHz signal in the sleeping rooms of hotels, dormitories and apartment building bedrooms when smoke alarms are installed in the sleeping room. Specifically, Chapter 18 of NFPA 72 requires audible notification appliances (horns, speakers or smoke detectors with an integral sounder bases) to produce the 520 HZ low frequency signal in all sleeping rooms of buildings with a protected premises fire alarm system. Whereas Chapter 29 of NFPA 72 only requires smoke alarms to produce the 520 Hz low frequency signal for people with hearing loss or provided voluntarily for those with hearing loss.

The different requirements within NFPA 72 present a life safety issue because the waking effectiveness of the 520 Hz low frequency is superior to 3 KHz audible alarm signal awakening high risk segments of the population. The low frequency signal needs to be provided in areas intended for sleeping for people over 65, people who are hard of hearing, school age children and people who are alcohol impaired.

There are several product solutions currently available in the market capable of providing the 520 Hz low frequency signal.

1. Fire alarm system horns and horn/strobes
2. Smoke detectors with integral sounder bases
3. Speakers connected to an Emergency Voice Alarm Communication (EVAC) system

Peer-Reviewed Research:

Ian R. Thomas and Dorothy Bruck, *Waking Effectiveness of Alarms for Adults Who Are Hard of Hearing* (Melbourne, Australia: Victoria University), National Fire Protection Association, 2007

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

The code change proposal will increase the cost of construction. The total installation cost will only increase in new R-1 and R-2 occupancies where a fire alarm system is required by Section 907 by requiring the use of the 520 Hz low frequency audible fire alarm signal.

In accordance with the included cost analysis the estimated price increase is \$57 per sleeping room for occupancies that are not required to utilize an emergency voice alarm communication (EVAC) system for occupant notification and approximately \$107 per sleeping room for occupancies that are required to utilize an (EVAC) system for occupant notification.

For non-EVAC systems, the solution utilizes a currently available smoke detector with an integral low frequency sounder base instead of installing a smoke alarm and low frequency horn. For EVAC systems, the solution utilizes a currently available fire alarm system speaker and a smoke detector with an integral low frequency sounder base.

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: The committee stated that although there are technical issues this is needed due to an aging population and the research shows that low frequency devices are more effective. In addition it was noted that there are devices that are currently available that can meet the requirement. (Vote: 9-5)

Assembly Action:

None

F144-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Thomas Daly, representing The Hospitality Security Consulting Group, LLC (thomas.daly@myhscg.com) requests Disapprove.

Commenter's Reason: This proposal would impose a mandate for buildings for a technology that does not exist. There are no listed and approved smoke alarms available that can produce a 520hz signal when operating on backup power pursuant to Sec. 907.2.10.6.

Until such time as potential devices are designed, tested, listed and approved, this mandate is premature.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

No cost impact to delay this proposed code change.

F144-18

F149-18

IFC: 907.5.2.2.5 (IBC: [F] 907.5.2.2.5), 1203.2.4; IBC: 2702.2.4

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Jason Webb, representing Automatic Fire Alarm Association Codes & Standards Committee (jwebb608@gmail.com)

2018 International Fire Code

Revise as follows

907.5.2.2.5 Emergency power. Emergency voice/ alarm communications systems shall be provided with emergency power in accordance with Section 1203. ~~The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72.~~

1203.2.4 Emergency voice/alarm communication systems. Emergency power shall be provided for emergency voice/alarm communication systems as required in Section 907.5.2.2.5. ~~The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72.~~

2018 International Building Code

~~[F] 2702.2.4 Emergency voice/alarm communication systems.~~ **Voice Alarm Communication Systems.**

Emergency power shall be provided for emergency voice/alarm communication systems as required in Section 907.5.2.2.5. ~~The system shall be capable of powering the required load for a duration of not less than 24 hours, as required in NFPA 72.~~

Reason: This code change is to provide clarification that the standby power for the EVACs system is to be designed to comply with NFPA 72.

We are deleting the reference and code section 1203.2.4. This is causing confusion and the standby power requirements for Fire Alarm systems is clearly outlined in NFPA 72.

This section contradicts itself. NFPA 72 10.6.7.2.1.2 requires secondary power for 24 hours under quiescent load but *also* requires the secondary power to be capable of operating the system for 15 minutes at maximum load after the 24 hours. Deleting the time and simply referencing the standard insures consistency.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will decrease the cost of construction. Depending on interpretation this could reduce the cost of construction. Overall this will provide code clarity and alignment with NFPA 72 and within the IBC-IFC

F149-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 2018 International Fire Code

907.5.2.2.5 Standby Emergency power. Emergency voice/ alarm communications systems shall be provided with ~~emergency standby~~ power in accordance with section 1203 NFPA 72.

1203.2.4 Emergency voice/alarm communication systems. ~~Emergency Standby~~ power shall be provided for emergency voice/alarm communication systems ~~as required~~ in accordance with NFPA 72.

2018 International Building Code

2702.2.4 Emergency Voice Alarm Communication Systems. ~~Standby Emergency~~ power shall be provided for emergency voice/alarm communication systems ~~as required~~ in accordance with NFPA 72 907.5.2.2.5.

Committee Reason: Approval of the modification is based on the improvement of the language to clarify that the requirements are for standby power. Approval of the proposal is based upon the proponent's published reason that it is appropriate to the leave the requirements in the NFPA 72 referenced standard. (Vote: 14-0)

Assembly Action:

None

F149-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Dustin J. Wakefield, PE, LEED AP, Virginia Department of General Services, representing Bureau of Capital Outlay Management requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

907.5.2.2.5 Standby Emergency power. Emergency voice/ alarm communications systems shall be provided with ~~standby power emergency power~~ in accordance with Section 1203-2702.2 of the International Building Code and NFPA 72.

1203.2.4 Emergency voice/alarm communication systems. ~~Standby power Emergency power~~ shall be provided for emergency voice/alarm communication systems ~~in accordance with~~ in accordance with Section 2702.2 of the International Building Code and NFPA 72.

2018 International Building Code

2702.2.4 Emergency Voice Alarm Communication Systems. ~~Standby Emergency~~ power shall be provided for emergency voice/alarm communication systems ~~in accordance with Section 907.5.2.2.5 as required~~ in Section 907.5.2.2.5 and NFPA 72.

Commenter's Reason: An emergency voice/alarm communication system (EVACS) is a critical life safety system that must remain operational during the initial phases of a fire incident. As such, EVACS are considered emergency power loads, which are governed under Article 700 - Emergency Systems - in the NEC. Furthermore, NFPA 72 explicitly states that generators used to provide secondary power for EVACS shall meet the requirements for a Type 10, Class 24, Level 1 system and be installed in accordance with NEC Article 700.

The initial proposed modification to change the language in the code to Standby power is contrary to the referenced standards governing the design and installation of the secondary power supply. It introduces confusion over the type of power system required and may, at times, result in the incorrect classification of a Legally Required or Option Standby Power System per NEC Articles 701 or 702.

It is recommended that the code language be modified as contained herein, and that the term "emergency power" be retained for this critical emergency system in order to avoid confusion and to be consistent with the referenced standards.

Bibliography: There are no applicable external references for this proposed modification.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Since this is solely a terminology issue, there is no anticipated cost impact on the design or construction process.

F149-18

F152-18

IFC: 907.5.2.3.3 (IBC: [F]907.5.2.3.3)

Proposed Change as Submitted

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

2018 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, 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 accommodate wired or wireless equipment. The future capability shall include one of the following:

1. The interconnection of the building fire alarm system with the unit smoke alarms.
2. The replacement of audible appliances with combination audible/visible appliances.
3. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

For wired equipment, the fire alarm power supply and circuits shall have not less than 5% excess capacity to accommodate future addition of visible alarm notification appliances, and access to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story.

Reason: Last cycle, F213-16 was approved with the intent of clarifying and standardizing the capability for future additions of alarm equipment to accommodate changes for units that may need to be converted to accommodate hearing impaired occupants. The question of a reasonable percentage for excess capacity of wired equipment was left unresolved, and I committed to bringing something back to address this so that the fire alarm industry would have a standardized basis for designing excess capacity into systems. The proposed text has been prepared based on what I learned in a discussion with an individual who has been instrumental in the development of ANSI A117.1 regarding the intent of the standard and his experience as an accessibility expert with respect to the relatively low frequency of units being retrofitted for hearing impaired occupants.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The requirement for future expansion capability already exists in this section. I am just trying to quantify the provision, so the cost consequence cannot be accurately assessed, since some installations my previously have provided more expansion capability and others less.

F152-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they liked the concept of requiring future design capability but the proposed language does not provide the necessary level of information and the wording is incomplete. (Vote: 14-0)

Assembly Action:

None

F152-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 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~~ the capability to support future visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. Such capability shall accommodate wired or wireless equipment. ~~The future capability shall include one of the following:~~

- ~~1. The interconnection of the building fire alarm system with the unit smoke alarms.~~
- ~~2. The replacement of audible appliances with combination audible/visible appliances.~~
- ~~3. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.~~

~~For wired equipment, the fire alarm power supply and circuits shall have not less than 5% excess capacity to accommodate future addition of visible alarm notification appliances, and access to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story.~~

907.5.2.3.3.1 Wired equipment. Where wired equipment is used to comply with the future capability required by Section 907.5.2.3.3, the system shall include one of the following capabilities:

1. The replacement of audible appliances with combination audible/visible appliances or additional visible notification appliances. 2. The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.
2. For wired equipment, the fire alarm power supply and circuits shall have not less than 5% excess capacity to accommodate future addition of visible alarm notification appliances, and a single access point to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story. The fire alarm system shop drawings required by Section 907.1.2 of the Code shall include the power supply and circuit documentation to accommodate future addition of visible notification appliances

Commenter's Reason:

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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The PC is an agreed to compromise by the proponents of F150, F151 and F152. The reason for the PC and all three proposals is they seek to clarify that all dwelling units within apartment buildings are not required to be pre-wired for visible notification appliances. This change is necessary because many designers and code authorities think the word "capability" means that conduit and wiring needed to be installed into each dwelling unit for possible future use.

Note that the way the cdpACCESS displays it appears to be all new text in Section 907.5.2.3.3.1 however much of the text is simply moved from Section 907.5.2.3.3 to new Section 907.5.2.3.3.1 as shown below.

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 future visible alarm notification appliances in accordance with Chapter 11 of ICC A117.1. Such capability shall accommodate wired or wireless equipment.

907.5.2.3.3.1 Wired equipment. ~~Where wired equipment is used to comply with~~ the future capability required by Section 907.5.2.3.3, the system shall include one of the following capabilities:

~~1. The interconnection of the building fire alarm system with the unit smoke alarms:~~

The replacement of audible appliances with combination audible/visible appliances or additional visible notification appliances.

The future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

For wired equipment, the fire alarm power supply and circuits shall have not less than 5% excess capacity to

accommodate future addition of visible alarm notification appliances, and a single access point to such circuits shall be available on every story. Such circuits shall not be required to be extended beyond a single access point on a story. The fire alarm system shop drawings required by Section 907.1.2 of the Code shall include the power supply and circuit documentation to accommodate future addition of visible notification appliances.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The requirement for future expansion capability already exists in this section. This proposal and PC quantify the provision, so the cost consequence can be accurately assessed, since some installations previously provided more expansion capability and others less.

F152-18

F153-18

IFC: 907.6.5 (IBC: [F] 907.6.5)

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Richard Roberts, representing Honeywell (richard.roberts@systemsensor.com); Jason Webb, representing Automatic Fire Alarm Association Codes & Standards Committee (jwebb608@gmail.com)

2018 International Fire Code

Revise as follows

907.6.5 ~~Access~~ **Access and visibility.** Access shall be provided to ~~each fire alarm device and notification appliance for devices, notification appliances, and equipment requiring periodic inspection, maintenance and testing. Where devices, notification appliances and equipment are concealed from view, an approved sign or other means to identify their location shall be provided.~~

Reason: One of the causes of "unwanted alarms" is identified as fire alarm devices that get installed but are not accessible to perform routine inspection, testing and maintenance. Duct mounted smoke detectors; detection in elevator shafts and atrium detection are some of the key areas of concern. During construction and initial testing special equipment is provided to reach these spaces, but when the building is in normal operation these special lifts and appliances are not available. Leaving smoke devices not tested or maintained.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. In 95% of all cases there will be no additional cost to install the fire alarm system and devices when properly designed. In some specific cases it may be more expensive to install the device "correctly" but that is the right way to do it.

F153-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had issues with the sign requirements and that it should say "other approved means." Additionally there was confusion about the link between the access and visibility requirements and noted that they are stated as separate requirements. (Vote: 14-0)

Assembly Action:

None

F153-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

907.6.5 Access and visibility. Access shall be provided to fire alarm devices, notification appliances, and equipment requiring periodic inspection, maintenance and testing. ~~Where devices, notification appliances and equipment are concealed from view, an approved sign or other means to identify their location shall be provided.~~

907.6.5.1 Concealed equipment. Fire alarm devices, notification appliances, and equipment shall not be concealed from view unless they are provided with an approved sign indicating their presence and location. The sign shall be in letters 1 inch (25mm) high on a contrasting background and be located in the immediate vicinity of the device, appliance or equipment.

Exception: Where approved signs are not required when the location is indicated on a chart, diagram, plan, or similar document maintained on the premises.

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

The access section isn't new; this language simply adds equipment to the list. Often, one of the most commonly missed items during inspection and testing is power supplies which are commonly placed above drop ceilings, out of view.

The concealed equipment section is new to the code but is necessary to provide the code official with a tool to require the equipment that currently is concealed or is added in concealed locations to be identified. As the use of wireless devices and equipment grows, so will the use of repeaters and similar components which will routinely be mounted in concealed spaces such as above ceilings. This requirement calls for the use of a sign to identify these units, but allows for a plan or diagram in lieu of signs if approved by the fire code official.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

In 95% of all cases there will be no additional cost to install the fire alarm system and devices when properly designed. In some specific cases it may be more expensive to install the device correctly but that is the right way to do it.

F153-18

F158-18

IFC: 907.10, 907.10.1

Proposed Change as Submitted

Proponent: Thomas Daly, representing The Hospitality Security Consulting Group, LLC (Thomas.Daly@myhscg.com)

2018 International Fire Code

Revise 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 an earlier replacement is specified in the manufacturer's published instructions.~~

Add new text as follows

907.10.1 Replacement. Newly installed smoke alarms shall be replaced, deemed construction, when they fail to respond to operability tests, or when they exceed 10 years from the date of manufacture, unless an earlier replacement is specified in the manufacturer's published instructions.

Reason: The proposed changes will clarify the intent of the language by differentiating between maintenance (testing, cleaning, etc) and replacement (construction) and apply the replacement obligation to newly installed smoke alarms, as there is no corresponding language in Chapter 11 making this replacement obligation applicable to existing installations.

Cost Impact: The code change proposal will not increase or decrease the cost of construction
The proposal will likely decrease the cost of operations.

F158-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the new proposed language of "deemed" and "newly installed" makes the new section more confusing and does not add clarity to the existing section requirements. (Vote: 14-0)

Assembly Action:

None

F158-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Thomas Daly, representing The Hospitality Security Consulting Group, LLC (thomas.daly@myhscg.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

907.10 Smoke alarm maintenance. Smoke alarms shall be tested and maintained in accordance with the manufacturer's instructions.

907.10.1 Replacement. Newly installed smoke alarms shall be replaced ~~, deemed construction,~~ when they fail to respond to operability tests, or when they exceed 10 years from the date of manufacture, unless an earlier replacement is specified in ~~the~~ manufacturers published instructions. Replacement is construction.

Commenter's Reason: As this provision in the 2018 IFC was not in Chapter 11, this proposed change clarifies the applicability and indicates the replacement activity is construction, not maintenance.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. Given the impact on affected occupancies, including but not limited to, apartments, condominiums, hotels, dormitories, board and care and assisted living the clarification as to intent will dramatically reduce the cost of compliance.

F158-18

F169-18

IFC: TABLE 911.1 (IBC: [F] TABLE 414.5.1)

Proposed Change as Submitted

Proponent: Geoffrey Raifsnider, Global Finishing Solutions, representing Self

2018 International Fire Code

**TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS^f**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
Hazard Category			
Combustible dusts ^a	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA ^b	Not required	Required
	IB ^c	Not Required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2 ^e	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist ^d	Detonation	Required	Not permitted
	Deflagration	Not required	Required

2018 International Building Code

**{F} TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS^{a, h}**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems ^b
HAZARD CATEGORY			
Combustible dusts ^c	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA ^d	Not Required	Required
	IB ^e	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2 ^g	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist ^f	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

- a. See Section 414.1.3.
- b. See the International Fire Code.
- c. As generated during manufacturing or processing.
- d. Storage or use.
- e. In open use or dispensing.
- f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the International Fire Code.

Reason: This proposed change brings this table in alignment with the current edition of NFPA 30

Cost Impact: The code change proposal will decrease the cost of construction
Elimination of deflagration venting or deflagration prevention system for enclosures used for open use or dispensing will reduce the cost of construction.

F169-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had concerns about the proposed deletion of all Class 1B flammable liquids from the table in relation to NFPA 30. It was noted that in there are class 1B liquids that can also be classified as an unstable reactive. It was suggested that a closer look at NFPA 30 is needed to make sure they are in alignment. (Vote: 13-0)

Assembly Action:

None

F169-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Geoffrey Raifsnider, representing Selfrequests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

**TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS^f**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
Hazard Category			
Combustible dusts ^a	-	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA ^b	Not required	Required
	IB ^c	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2 ^e	Not required	Required
Special Uses			
Acetylene generator rooms	-	Not required	Required
Grain processing	-	Not required	Required
Liquefied petroleum gas distribution facilities	-	Not required	Required
Where explosion hazards exist ^d	Detonation	Required	Not permitted
	Deflagration	Not required	Required

- a. Combustible dusts that are generated during manufacturing or processing. See definition of “Combustible dust” in Chapter 2.
- b. Storage or use.
- c. ~~In open use or dispensing.~~ Where heated above its boiling point.
- d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.

2018 International Building Code

**[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS^{a, h}**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems ^b
HAZARD CATEGORY			
Combustible dusts ^c	-	Not Required	Required
Cryogenic flammables	-	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA ^d	Not Required	Required
	IB ^e	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	-	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2 ^g	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	-	Not Required	Required
Grain processing	-	Not Required	Required
Liquefied petroleum gas-distribution facilities	-	Not Required	Required
Where explosion hazards exist ^f	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

- a. See Section 414.1.3.
- b. See the International Fire Code.
- c. As generated during manufacturing or processing.
- d. Storage or use.
- e. ~~In open use or dispensing.~~
- e. Where heated above its boiling point.
- f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the International Fire Code .

Commenter's Reason: The committee stated their concern was that the original proposal to remove Class IB from the row for Flammable Liquids from Table 911.1 Explosion Control Requirements would also imply that other Class IB liquids that can be classified as an unstable (reactive) material would not need explosion control. Table 911.1 currently includes a row for all Unstable (reactive) materials. The original proposal did not make any changes

to this row. The definition of Unstable (reactive) material and the various Classifications are currently in the code and no changes are being proposed to those sections.

If there is a 1B flammable liquid that is also an Unstable (reactive) material, then Table 911.1 would still address where explosion control is required.

This modification would address the concerns raised by the committee and the opponents to the original proposal by only requiring explosion control for 1B Flammable Liquids heated above its boiling point. These concerns were based upon the direction that NFPA 30 will be taking with regards to explosion control requirements for flammable and combustible liquids, not the current edition of NFPA 30.

Requirements for Unstable (reactive) materials would remain unchanged.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. Elimination of deflagration venting or deflagration prevention systems for enclosures used for open use or dispensing of Class 1B flammable liquids not heated above their boiling point will reduce the cost of construction.

F169-18

F173-18

IFC: 913.2.2 (IBC: [F] 913.2.2)

Proposed Change as Submitted

Proponent: Kevin Scott, representing KH Scott & Associates LLC (khs cottassoc@gmail.com)

2018 International Fire Code

Revise as follows

913.2.2 Circuits supplying fire pumps. Cables used for survivability of circuits supplying fire pumps shall be protected using one of the following methods:

Exception: Cables, or portions of cables, located within a fire pump room or generator room which is separated from the remainder of the occupancy with fire-resistance-rated construction.

1. Cables used for survivability of required critical circuits shall be *listed* in accordance with UL 2196 and shall have a *fire-resistance rating* of not less than ~~1-hour~~ 2 hours.
2. Electrical circuit protective systems shall have a fire-resistance rating of not less than ~~1-hour~~ 2 hours. Electrical circuit protective systems shall be installed in accordance with their listing requirements.
3. Construction having a *fire-resistance rating* of not less than ~~1-hour~~ 2 hours.
4. The cable or raceway is encased in a minimum of 2 inches (50 mm) of concrete.

Reason: Protecting the fire pump power supply is essential, but more critical when the pump is located within the building.

Section 695.6(A)(2)(d) of NFPA 70 requires that the power supply for fire pumps be protected for a minimum of 2 hours when it is routed through the building. The revisions to Items 1, 2 and 3 will correlate this requirement with the National Electrical Code.

The exception is added to clarify that cables located within the fire pump room are not required to be protected, and cables located with the generator room are not required to be protected. The fire-resistance rating is not specified since it could be either 1-hour or 2-hour based on other code sections.

- IBC Section 901.8 requires that the fire pump room be separated by either 1-hour or 2-hour construction depending on whether the building is high-rise or not.
- IFC/IBC Section 903.3.1.1 allows the elimination of sprinklers in the generator room if the generator room is of 2-hour construction and provided with a fire detection system.

Based on the above sections the separation could be 1-hour or 2-hour. It should also be noted that the 2-hour separation for the generator is not required, but rather an option. If the 2-hour separation and detection is not provided, then the room is provided with sprinklers. Additionally, the proposed exception in 913.2.2 would not apply since there is no fire-resistance-rated separation.

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

This may increase the cost of construction if listed cables are used and now must be 2-hour rated. However, Item 4 allows embedding the cables in concrete which would not require 2-hour listed cables.

F173-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had issues with the language regarding the inclusion of the generator room into the fire pump room and the 1 hour vs. 2 hour rating requirement. The preference was for proposal F174-18. (Vote: 14-0)

Assembly Action:

None

F173-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Solomon, National Fire Protection Association, representing National Fire Protection Association requests As Submitted.

Commenter's Reason: The original F173-18 proposal does indeed provide correlation with Article 695 of the *National Electrical Code*, and NFPA 20, *Standard for the Installation of Stationary Fire Pumps for Fire Protection*. Specifically, the conductors leading up to the fire pump room per the NEC, have to be rated for 2 hours. The equivalent protection method of burying the conductors under two inches of concrete is also acceptable. In a separate comment we will recommend disapproving companion proposal F174-18, as this proposal does not provide correlation with the NEC as indicated in the reason statement.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This may increase the cost of construction if listed cables are used and now must be 2-hour rated. However, Item 4 allows embedding the cables in concrete which would not require 2-hour listed cables.

F173-18

F174-18

IFC: 913.2.2 (IBC: [F] 913.2.2)

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

913.2.2 Circuits supplying fire pumps. Cables used for survivability of circuits supplying fire pumps shall be protected using one of the following methods:

1. Cables used for survivability of required critical circuits shall be *listed* in accordance with UL 2196 and shall have a *fire-resistance rating* of not less than 1 hour.
2. Electrical circuit protective systems shall have a fire-resistance rating of not less than 1 hour. Electrical circuit protective systems shall be installed in accordance with their listing requirements.
3. Construction having a *fire-resistance rating* of not less than 1 hour.
4. The cable or raceway is encased in a minimum of 2 inches (50 mm) of concrete.

Exception: This section shall not apply to cables, or portions of cables, located within a fire pump room or generator room which is separated from the remainder of the occupancy with fire-resistance-rated construction.

Reason: Protecting the fire pump power supply is essential, but more critical when the pump is located within the building.

Section 695.6(A)(2)(d) of NFPA 70, the National Electrical Code, requires that the power supply for fire pumps be protected for a minimum of 2 hours when it is routed through the building. These revisions will correlate this requirement with the National Electrical Code.

The exception is added to clarify that where the cables are located within the fire pump room are not required to be protected, and cables located with the generator room are not required to be protected. The fire-resistance rating is not specified since it could be either 1-hour or 2-hour based on other code sections.

- IBC Section 901.8 requires that the fire pump room be separated by either 1-hour or 2-hour construction depending on whether the building is high-rise or not.
- IFC/IBC Section 903.3.1.1 allows the elimination of sprinklers in the generator room if the generator room is of 2-hour construction and provided with a fire detection system.

Based on the above sections the separation could be 1-hour or 2-hour. It should also be noted that the 2-hour separation for the generator is not required, but rather an option. If the 2-hour separation and detection is not provided, then the room is provided with sprinklers. Additionally, the proposed exception in 913.2.2 would not apply since there is no fire-resistance-rated separation.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Correlates with the NEC so is simply a clarification.

F174-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. (Vote: 14-0)

Assembly Action:

None

F174-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Solomon, National Fire Protection Association, representing National Fire Protection Association requests Disapprove.

Commenter's Reason: The reason statement provided for proposal F174-18 indicates the proposal is intended to provide correlation with requirements of the National Electrical Code (NEC). The current language in the proposal conflicts with the requirements of the NEC which requires 2-hour rated conductors outside of the fire pump room. In a separate comment we have recommended approving proposal F173-18 in lieu of F174-18.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
There will be no cost impact since as proposed would have been less restrictive than NFPA 70 would require.

F174-18

F180-18

IFC: 1031.3.1

Proposed Change as Submitted

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

2018 International Fire Code

Revise as follows

1031.3.1 Group I-2. In Group I-2, the required clear width for *aisles, corridors and ramps* that are part of the required *means of egress* shall comply with Section 407.4.3 of the International Building Code and Section 1020.2. ~~The facility shall have a plan to maintain the required clear width during emergency situations.~~

Exception: In areas required for bed movement, equipment shall be permitted in the required width where all of the following provisions are met:

1. The equipment is low hazard and wheeled.
2. The facility shall have a plan to remove wheeled equipment in order to maintain the required clear width during emergency situations.
3. The equipment does not reduce the effective clear width for the *means of egress* to less than 5 feet (1525 mm).
4. The equipment is limited to:
 - 4.1. Equipment and carts in use.
 - 4.2. Medical emergency equipment.
 - 4.3. Infection control carts.
 - 4.4. Patient lift and transportation equipment.
5. Medical emergency equipment and patient lift and transportation equipment, when not in use, are required to be located on one side of the corridor.
6. The equipment is limited in number to not more than one per patient sleeping room or patient care room within each smoke compartment.

Reason: This clarification of language is required in order to conform with Federal Standards and CMS enforcement rules (K211). The reference to Section 407.4.3 is to point to the fixed furniture requirements for hospitals and nursing homes. This relocated language gives the AHJ enforcement language to ensure that all wheeled equipment that may be occasionally found in hallways, must be included in the facility's emergency plan and must be moved out of the required egress width in the event of an emergency situation. Items that are often found in corridors include crash carts and infection control carts, which are needed to be near the point of use and readily available in typical circumstances, but must be moved out of the corridor during emergencies.

This proposal is submitted by the ICC Committee on Healthcare (CHC). The CHC was established by the ICC Board to evaluate and assess contemporary code issues relating to 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 2017 the CHC held 2 open meetings and numerous conference calls, *which included members of the committees as well as any interested parties, to discuss and debate the proposed changes*. Information on the CHC, including: meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CHC effort can be downloaded from the CHC website at: <https://www.iccsafe.org/codes-tech-support/cs/icc-committee-on-healthcare/>.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposed language is operational clarification.

F180-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had concerns with the new exception provision for a facility to have a plan to remove wheeled equipment in that it could require going into a more hazardous area to remove it and it could be impractical. Additionally a conflict was noted between the new exception and the existing one that would follow it in the list. (Vote: 12-2)

Assembly Action:

None

F180-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Williams, representing Healthcare Committee (ahc@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1031.3.1 Group I-2. In Group I-2, the required clear width for *aisles, corridors* and *ramps* that are part of the required *means of egress* shall comply with Section 407.4.3 of the International Building Code and Section 1020.2. The facility shall have a plan to maintain the required clear width during emergency situations.

Exception: In areas required for bed movement, equipment shall be permitted in the required width where all of the following provisions are met:

1. The equipment is low hazard and wheeled.
2. ~~The facility shall have a plan to remove wheeled equipment in order to maintain the required clear width during emergency situations.~~
3. The equipment does not reduce the effective clear width for the *means of egress* to less than 5 feet (1525 mm).
4. The equipment is limited to:
 - 4.1. Equipment and carts in use.
 - 4.2. Medical emergency equipment.
 - 4.3. Infection control carts.
 - 4.4. Patient lift and transportation equipment.
5. Medical emergency equipment and patient lift and transportation equipment, when not in use, are required to be located on one side of the corridor.
6. The equipment is limited in number to not more than one per patient sleeping room or patient care room within each smoke compartment.

Commenter's Reason: The committee did not like the wheeled equipment moved to the list in the exception. We have left the language where it currently is. The addition of the reference to Section 407.4.3 in IBC is needed as a pointer to the allowance for fixed furniture.

Also not letting me submit proposal.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal is a pointer with no changes to current requirements.

F180-18

F182-18

IFC: 105.6.47 , 202, 1001.3, 1031.11, 1031.11.1, 1031.11.2

Proposed Change as Submitted

Proponent: Michael O'Brian, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Add new text as follows

105.6.47 Valet trash collection. An operational permit is required to use a valet trash collection service in a Group R-2 Occupancy.

Add new definition as follows

VALET TRASH COLLECTION A service that collects occupant-generated combustible trash or recyclable materials from dwelling units, where the trash is left outside of dwelling units for scheduled pickup.

Add new text as follows

1001.3 Permits. Permits shall be required as forth in Section 105.6 for the activities regulated in 1031.11.

1031.11 Combustible trash in means of egress. Combustible trash or recyclable materials shall not be placed in exits, in enclosures for stairways or ramps, in corridors, in elevator lobbies or on egress balconies except as permitted by one of the following:

1. Combustible trash or recyclable materials associated with construction, demolition, remodeling, or alterations in accordance with Section 3311.3.
2. Combustible trash or recyclable materials in corridors or on egress balconies of Group R-2 Occupancies that is awaiting scheduled valet trash collection in accordance with Sections 1031.11.1 and 1031.11.2.

1031.11.1 Valet Trash collection. Trash or recyclable materials awaiting valet trash collection shall only be placed in a corridor or on an egress balcony within 18 hours of scheduled pickup and shall not obstruct the minimum egress width required by Section 1020.2.

Trash or recyclable materials awaiting valet trash collection shall be placed completely inside of one or more containers with a closed lid that complies with Section 1031.11.2. Additional trash or recyclable material placed outside of compliant containers are prohibited in a corridor or egress balcony.

1031.11.2 Valet trash collection containers. Containers used for valet trash collection shall not exceed a capacity of 2.0 cubic feet (15 gallons, 0.06 cubic meters) and shall be provided with tight-fitting or self-closing lids. Containers and lids shall comply with one of the following:

1. Containers and lids located in an area protected by fire sprinklers shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. The automatic sprinkler system supplying the sprinklers shall be permitted to comply with Section 903.3.1.1 or 903.3.1.2.
2. Containers and lids located in an area that is not protected by fire sprinklers in accordance with Item 1 shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 150 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. Wall and ceiling finishes in the area where valet trash collection containers are placed for pickup shall be noncombustible or shall comply with the requirements of Section 803 for Class B interior finish materials.

Reason: Valet trash collection services have become common in many R-2 occupancies. Occupants receiving this service place trash and recyclables in the corridors outside of their apartments to be picked up by a collection service, which typically comes by on a regular scheduled basis.

Currently, there are no provisions in the IFC that specifically prohibit or regulate the placement of combustible trash or recyclables in common egress areas for pickup by others. Without regulation, the hazard of excessive fire loading or exit obstruction is significant. This proposal seeks to establish reasonable safety precautions to allow this process to be offered, based on:1. An operational permit is required, ensuring that the Fire Code Official is aware that the service is being provided and encouraging code compliance.2. Requires that trash containers not obstruct the minimum required clear width of the means of egress.3. Clarifies that, in general, trash is not allowed to be accumulated in exits, corridors or egress balconies.4. Regulates trash containers and interior finish of the container placement area based on whether fire sprinklers are provided.

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 2017 the Fire-CAC has held 3 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

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal does not affect construction costs but may increase cost of compliance with the fire code depending upon how the provisions are enforced. However enforcement of these provisions will reduce the risk of fires.

F182-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: Approval is based upon the proponent's published reason. (Vote: 9-5)

Assembly Action:

None

F182-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1031.11 Combustible trash in means of egress. Combustible trash or recyclable materials shall not be placed in exits, in enclosures for stairways or ramps, in corridors, in elevator lobbies or on egress balconies except as permitted by one of the following:

1. Combustible trash or recyclable materials associated with construction, demolition, remodeling, or alterations in accordance with Section 3311.3.
2. Combustible trash or recyclable materials in corridors or on egress balconies of Group R-2 Occupancies that is awaiting scheduled valet trash collection in accordance with Sections 1031.11.1 ~~and through 1031.11.23.~~

1031.11.3 Automatic Sprinkler Protection ~~Valet trash collection shall only be permitted in Group R-2 occupancies protected by an automatic sprinkler system installed throughout the building in accordance with Section 903.3.1.1 or 903.3.1.2.~~

Commenter's Reason: Valet trash collection being permitted in R-2 corridors is a subject of disagreement among those in fire suppression, fire protection and fire prevention arenas. Corridors historically have been required to be free of obstructions for the use of occupants evacuating the building as well as by firefighters accessing the building and individual units for rescue and firefighting activities. The valet trash proposal introduces a hazard to those critical paths that will provide a fire hazard fuel load, within the path.

This is acknowledged by the criteria within the proposal itself.

Unfortunately, much of the criteria is going to rely on voluntary compliance. Even if a local enforcing agency inspects R-2 occupancies on a cyclical basis, problems presenting fire hazards from non-compliance with the limitations within this proposal can occur weekly. There will be bad actors in the business as well as the good actors.

For that reason this activity should only be permitted in R-2 occupancies where the building is protected by an automatic sprinkler system to provide a level of safety should a fire occur involving the trash located in the critical corridor egress and firefighter access paths.

Note that there is no height limitation for the provision of this service. As written it can occur in a high-rise building and it is well known there are 1000s of residential high-rise buildings that do not have automatic fire suppression systems installed throughout the building. The impact of fire in a high-rise building is well documented as well as the impact of fire within a required means of egress path.

I'll only refer to one such fire that occurred in an unsuppressed residential occupancy on January 9, 2012 in Chicago when a dwelling unit door to a 9th floor corridor was left open as occupants escaped the fire in the dwelling unit, (reportedly intentionally to let a pet escape), resulting in the products of combustion filling the corridor and resulting in the death of a woman who had unknowingly ridden an elevator to the fire floor. Now the code will allow the actual fuel load for a fire to be located in a similar corridor. Possibly subject to a wind driven fire, an event that has turned out deadly for the fire service.

If this proposal is to end up being part of the fire code it must be predicated on the existence of automatic fire suppression throughout the building.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This does not impact the construction cost of buildings. It impacts where a hazardous activity may occur.

Public Comment 2:

Proponent: Kara Gerczynski, Elizabeth Fire Protection District, representing Elizabeth Fire Protection District (kara@elizabethfire.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

1031.11.1 Valet Trash collection. Trash or recyclable materials awaiting valet trash collection shall only be placed in a corridor or on an egress balcony within 18 hours of scheduled pickup and shall not obstruct the minimum egress width required by Section 1020.2.

Trash or recyclable materials awaiting valet trash collection shall be placed completely inside of one or more containers with a ~~closed~~ latching lid that complies with Section 1031.11.2. Additional trash or recyclable material placed outside of compliant containers are prohibited in a corridor or egress balcony.

1031.11.2 Valet trash collection containers. Containers used for valet trash collection shall not exceed a capacity of 2.0 cubic feet (15 gallons, 0.06 cubic meters) and shall be provided with tight-fitting or self-closing latching lids. Containers and lids shall comply with one of the following:

1. Containers and lids located in an area protected by fire sprinklers shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. The lid shall be equipped with a latching device that engages to secure the lid to the container and that can only be released manually. The automatic sprinkler system supplying the sprinklers shall be permitted to comply with Section 903.3.1.1 or 903.3.1.2.
2. Containers and lids located in an area that is not protected by fire sprinklers in accordance with Item 1 shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 150 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. The lid shall be equipped with a latching device that engages to secure the lid to the container and that can only be released manually. Wall and ceiling finishes in the area where valet trash collection containers are placed for pickup shall be noncombustible or shall comply with the requirements of Section 803 for Class B interior finish materials.

Commenter's Reason: The proponent is basing their code change on a container and lid that is entirely of noncombustible materials but has no way to ensure that the lid will remain closed to provide for that noncombustible rating. Providing a latching lid will ensure the following: 1. Trash is limited to what fits inside the container. Limiting the amount of fire load in the corridors. 2. The sprinkler system designed for the corridor will meet the requirements if the trash is secured in the container. If the lid was not secured or partially open, the sprinkler system may not meet the design requirements for light hazard of a corridor. 3. Having a latching lid will help heat sources from entering the container. 4. In the event of a fire, if the containers fall over, trash would not be scattered throughout the corridor. It would also help firefighter safety while they are providing suppression operations in the corridor.

Having a latching lid is the only way to secured combustibles in the container as the proponents of the proposal expect the use of valet trash.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There are no construction costs with the proposed modification to the code proposal.

Public Comment 3:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Andrew Klein (andrew@asklein.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

105.6.47 Valet trash collection. An operational permit is required to use a for providers of valet trash collection service in a Group R-2 Occupancy Occupancies.

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This Public Comment addresses an issue that was raised during the Committee Action Hearing to make the valet trash collection permitting requirements more streamlined for jurisdictions who choose to require permits. Many apartments who offer such services contract with a service provider. The revised language makes it clear that operational permits are required for the service provider and not for each individual site serviced within a jurisdiction.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. By clarifying that permits are required of the service provider, this Public Comment lessens the burden on jurisdictions. The decrease in the cost of permitting is transferred as savings to operators of apartment complexes.

Public Comment 4:

Proponent: Andrew Klein, representing Valet Living (andrew@asklein.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1031.11.2 Valet trash collection containers. Containers used for valet trash collection shall not exceed a capacity of 2.0 cubic feet (15 gallons, 0.06 cubic meters) and shall be provided with tight-fitting or self-closing lids. Containers and lids shall comply with one of the following:

1. Containers and lids located on an exterior egress balcony of a building not exceeding three stories above grade plane shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. The egress balcony shall be constructed in accordance with Section 1021.
2. Containers and lids located in an area protected by fire sprinklers shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. The automatic sprinkler system supplying the sprinklers shall be permitted to comply with Section 903.3.1.1 or 903.3.1.2.
23. Containers and lids not located on an exterior egress balcony in accordance with Item 1 or located in an area that is not protected by fire sprinklers in accordance with Item 1-2 shall be constructed entirely of noncombustible materials or materials that meet a peak rate of heat release not exceeding 150 kW/m² when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m² in the horizontal orientation. Containers and lids shall be listed or bear the label of an approved agency that validates compliance with this requirement. Wall and ceiling finishes in the area where valet trash collection containers are placed for pickup shall be noncombustible or shall comply with the requirements of Section 803 for Class B interior finish materials.

Commenter's Reason: The practice of door-side trash collection in apartment communities, commonly referred to as valet trash, began with a single apartment unit in Tampa in 1995 and now extends to 1.5 million residences among more than 5,000 apartment communities in 40 states. The industry has a perfect safety record since inception - no history of life loss or impediment to life safety, resident evacuation building safety, or first responder safety. Fire officials in certain local jurisdictions have questioned whether the service meets the fire code in terms of the combustibility features of Chapter 3 and the egress provisions of Chapter 10, but everyone agrees that the code has only pointers - no definitive answer on the practice or regulation of it. To settle the uneven interpretations and enforcements, the industry joined the FCAC proponent in Columbus in April in support of the F-182-18, which was approved as submitted.

We offer a tweak to what the language that was approved. The requirement that collection containers in non-sprinkled open-air corridors and breezeways be constructed of non-combustible materials or materials that meet an ASTM 1354 peak heat release of 150 kW/m² is excessive in proportionality of risk when applied to certain unsprinkled construction – which was unsprinkled because the life safety risk of the unsprinkled areas was not sufficient to require sprinklers in the building code.

Members of the FCAC offered a compromise of allowing containers meeting an ASTM 1354 peak heat release of 300 kW/m² to be used in unsprinkled open-air corridors and breezeways in buildings of up to three stories in construction. The industry supports this compromise as offered in this public comment.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. The net effect of the public comment and overall code change proposal will significantly decrease the cost of construction to the degree that developers can forego the expense and space of trash rooms, chutes and dumpster systems. The cost of non-combustible containers or ones that meet the ASTM 1354 standard at 150 kW/m² are 4.5 times that of those which meet the 300 kW/m² peak heat release rate with no data or testing on whether the more stringent standard, which carries a deleterious fiscal impact on the industry, is proportional to the risk.

Public Comment 5:

Proponent: Brian M. McGraw, P.E., Virginia Department of Fire Programs, State Fire Marshal's Office, representing Virginia State Fire Marshal's Office, Virginia Fire Services Board (brian.mcgraw@vdfp.virginia.gov) requests Disapprove.

Commenter's Reason: The Virginia Fire Services Board opposes Proposal F182-18. This proposal will result in unsafe conditions for building occupants and firefighters. The premise of “valet trash” violates several sections of the current Fire Code, including:

- 304.1: Combustible waste material creating a fire hazard shall not be allowed to accumulate in buildings or structures or upon premises.
- 304.2: Storage of combustible rubbish shall not produce conditions that will create a nuisance or a hazard to the public health, safety or welfare.
- 1031.2: Required exit accesses, exits and exit discharges shall be continuously maintained free from obstructions or impediments to full instant use in the case of fire or other emergency where the building area served by the means of egress is occupied.
- 1031.1: A means of egress shall be free from obstructions that would prevent its use, including the accumulation of snow and ice.
- 1031.6: ... Furnishings, decorations or other objects shall not be placed so as to obstruct exits, access thereto, egress therefrom, or visibility thereof...

The above requirements are longstanding fundamentals of protecting the means of egress and providing for fire safety in buildings. However, because one or more businesses have undertaken business practices that violate current code requirements, the answer is to weaken the requirements, potentially putting occupants and firefighters at risk.

The proposal states that “trash or recyclable materials awaiting valet trash collection shall only be placed in a corridor or on an egress balcony within 18 hours of scheduled pickup and shall not obstruct the minimum egress width required by Section 1020.2”. What happens if the scheduled pickup does not occur? Is the trash or recyclable material allowed to remain in the corridor until the next scheduled pickup? How does the tenant placing their trash or recyclable material in the corridor know what the minimum egress width is? How do you enforce this? Who is responsible for compliance? The valet trash service provider? The building owner? The building manager? The tenant?

The proposal specifies the size and type of container that must be used and that they must be provided with tight-fitting or self-closing lids. However, the proposal does not require the lid to be used. What if the occupant has more trash than will fit in the container? Leave the lid off? Put it next to the container?

There are no restrictions on the type of materials that can be put out. During the Committee Action Hearings, the one service provider that was represented stated that their policies prohibited hazardous materials, flammable liquids, etc. What about the other service providers?

In limited visibility, firefighters follow the wall to find their way. We teach the general public to follow the wall to find their way out in smoke. This proposal allows the introduction of obstructions that will require firefighters and occupant that are attempting to follow the wall to lose contact with the wall.

This proposal fails to address a number of important factors and presents a multitude of enforcement issues and should be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

This proposal affects the operation of a building after occupancy and, therefore, has no impact on cost of construction.

F185-18

IFC: 1103.7.5.1

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Jason Webb, Automatic Fire Alarm Association Codes & Standards Committee, representing Automatic Fire Alarm Association Codes & Standards Committee; Richard Roberts, representing Honeywell (richard.roberts@systemsensor.com)

2018 International Fire Code

Revise as follows

1103.7.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in ~~existing~~ the following:

1. Existing Group R-1 hotels and motels more than three stories ~~or in height.~~
2. Existing Group R-1 hotels and motels with more than 20 sleeping units.
3. Existing unsprinklered Group R-1 hotels and motels more than one story in height.

Exceptions:

1. Buildings less than two stories in height where all *sleeping units*, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each *sleeping unit* has direct access to a *public way, egress court* or yard.
2. Manual fire alarm boxes are not required throughout the building where 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 less than one manual fire alarm box is installed at an *approved* location.

Reason: For existing unsprinklered Group R-1 occupancies a fire alarm system would be required if the building is more than one story or has more than 20 sleeping units.

Fires in some older multiple story unsprinklered hotels without fire alarm systems, as was allowed in the IBC/IFC up to 2003, have resulted in multiple fire fatalities and fire injuries, where a fire in on the first-floor envelopes the second story means of egress.

Such fires in two-story motels without automatic sprinkler systems occurred on January 4, 2010 in South Birmingham, AL (4 fatalities on the second floor), on December 14, 2013 in Wausau, WI (20 injuries) and in Point Pleasant Beach, NJ on March 21, 2014 (four fatalities on the second floor).

One additional example of a multiple life-loss fire was the Newport, OR City Center Motel on August 5, 2016, 4 civilian fire deaths and 3 civilian fire injuries. Fire deaths occurred on both the ground floor and the 2nd floor. The fire started on the ground floor. No sprinklers and no reports of a fire alarm system sounding.

These fires resulted in fatalities, as second floor occupants could not escape due to the means of egress being blocked by smoke and flames. In these fires resulting in fatalities, no fire alarm system was in place to provide early warning to occupants.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

This change will impact the cost of construction or operation of a smaller number existing hotels. When you need to add notification (horns and strobes) to these buildings, the cost would be about 350.00 a device installed.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that the proposed requirements are more restrictive than those for new construction and could result in newly occupied buildings having to add a system after the certificate of occupancy is issued. (Vote: 9-5)

Assembly Action:

None

F185-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Kevin Scott, representing FCAC (khscothassoc@gmail.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

1103.7.5.1 Group R-1 hotel and motel manual fire alarm system. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-1 hotels and motels more than ~~three stories~~ one story in height or with more than 20 *sleeping units*.

Exceptions:

1. ~~Buildings~~ A manual fire alarm system is not required in buildings less than two stories in height where all sleeping units, attics and crawl spaces are separated by 1-hour fire-resistance-rated construction and each sleeping unit has direct access to a public way, egress court or yard.
2. A manual fire alarm system is not required in buildings not more than three stories in height and not more than 20 sleeping units equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
- ~~2-3.~~ Manual fire alarm boxes are not required throughout the building where the following conditions are met:
 - ~~2-1-3.1.~~ The building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.
 - ~~2-2-3.2.~~ The notification appliances will activate upon sprinkler water flow.
 - ~~2-3-3.3.~~ Not less than one manual fire alarm box is installed at an approved location.

Commenter's Reason: 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 firesafety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This public comment continues with the original concept of addressing multi-story, unsprinklered hotels and motels.

The charging statement requires a fire alarm system for existing facilities greater than 1 story. Exception 1 is revised to clarify that it eliminates the entire fire alarm system where each unit has direct egress and 1-hour separation in a 1-story building.

The new Exception 2 eliminates the requirement for a fire alarm system in sprinklered buildings up to 3 stories provided the building contains no more than 20 sleeping units.

Application to existing buildings would be as follows:

Fire Alarm System Required in Existing *SPRINKLERED* Group R-1

Number of Units	1 Story	2 or 3 Stories	3 stories
20 or less	Not required	Not Required	Required ^b
more than 20	Required ^{a,b}	Required ^b	Required ^b

a. Exception 1 could eliminate the fire alarm system for 1-story buildings.

b. Exception 3 would eliminate all but one manual fire alarm box.

Fire Alarm System Required in Existing *NONSPRINKLERED* Group R-1

Number of Units	1 Story	2 or 3 Stories	3 stories
20 or less	Not required	Required	Required
more than 20	Required ^a	Required	Required

a. Exception 1 could eliminate the fire alarm system for 1-story buildings.

Fires in two-story motels without automatic sprinkler systems occurred on January 4, 2010 in South Birmingham, AL (4 fatalities on the second floor), on December 14, 2013 in Wausau, WI (20 injuries) and in Point Pleasant Beach, NJ on March 21, 2014 (four fatalities on the second floor).

One additional example of a multiple life-loss fire was the Newport, OR City Center Motel on August 5, 2016, 4 civilian fire deaths and 3 civilian fire injuries. Fire deaths occurred on both the ground floor and the 2nd floor. The fire started on the ground floor. No sprinklers and no reports of a fire alarm system sounding.

These fires resulted in fatalities, as second floor occupants could not escape due to the means of egress being blocked by smoke and flames. In fires resulting in fatalities, no fire alarm system was in place to provide early warning to occupants.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The code change proposal will increase the onetime cost of ownership. When you need to add notification (horns and strobes) to these buildings, the cost would be about \$350.00 a device installed.

Some hotel chains are already adding fire alarm systems on their own.

F193-18

IFC: 202 (New), TABLE 906.1 (IBC: [F] TABLE 906.1), 1202.1, SECTION 1204 (New), 3106.6.2, 3107.16, SECTION 3307 (New), UL (New), Chapter 80

Proposed Change as Submitted

Proponent: Andrew King, International Association of Fire Chiefs, Fire & Life Safety Section, representing International Association of Fire Chiefs, Fire & Life Safety Section (andyk@franklintrn.gov)

2018 International Fire Code

Add new definition as follows

PORTABLE GENERATOR. A mobile internal combustion engine-driven device that provides electrical power.

Revise as follows

**TABLE 906.1
ADDITIONAL REQUIRED PORTABLE FIRE EXTINGUISHERS**

SECTION	SUBJECT
303.5	Asphalt kettles
307.5	Open burning
308.1.3	Open flames—torches
309.4	Powered industrial trucks
<u>1204.10</u>	<u>Portable generators</u>
2005.2	Aircraft towing vehicles
2005.3	Aircraft welding apparatus
2005.4	Aircraft fuel-servicing tank vehicles
2005.5	Aircraft hydrant fuel-servicing vehicles
2005.6	Aircraft fuel-dispensing stations
2007.7	Heliports and helistops
2108.4	Dry cleaning plants
2305.5	Motor fuel-dispensing facilities
2310.6.4	Marine motor fuel-dispensing facilities
2311.6	Repair garages
2404.4.1	Spray-finishing operations
2405.4.2	Dip-tank operations
2406.4.2	Powder-coating areas
2804.3	Lumberyards/woodworking facilities
2808.8	Recycling facilities
2809.5	Exterior lumber storage
2903.5	Organic-coating areas
3006.3	Industrial ovens
3104.12	Tents and membrane structures
3206.10	High-piled storage
3315.1	Buildings under construction or demolition
3317.3	Roofing operations
3408.2	Tire rebuilding/storage
3504.2.6	Welding and other hot work
3604.4	Marinas
3703.6	Combustible fibers
5703.2.1	Flammable and combustible liquids, general
5704.3.3.1	Indoor storage of flammable and combustible liquids
5704.3.7.5.2	Liquid storage rooms for flammable and combustible liquids
5705.4.9	Solvent distillation units
5706.2.7	Farms and construction sites—flammable and combustible liquids storage
5706.4.10.1	Bulk plants and terminals for flammable and combustible liquids
5706.5.4.5	Commercial, industrial, governmental or manufacturing establishments—fuel dispensing
5706.6.4	Tank vehicles for flammable and combustible liquids
5906.5.7	Flammable solids
6108.2	LP-gas

1202.1 Definitions. The following terms are defined in Chapter 2:
BATTERY SYSTEM, STATIONARY STORAGE.

BATTERY TYPES.

1. Lead-acid battery.

CAPACITOR ARRAY.

CAPACITOR ENERGY STORAGE SYSTEM.

CRITICAL CIRCUIT.

EMERGENCY POWER SYSTEM.

ENERGY MANAGEMENT SYSTEMS.

FUEL CELL POWER SYSTEM, STATIONARY.

PORTABLE GENERATOR.

STANDBY POWER SYSTEM.

STATIONARY BATTERY ARRAY.

Add new text as follows

SECTION 1204 PORTABLE GENERATORS

1204.1 Portable generators. The use, operation, and maintenance of portable generators shall comply with this section.

1204.2 Carbon monoxide mitigation. Portable generators shall be listed and labeled in accordance with the UL 2201 carbon monoxide mitigation requirements.

1204.3 Operation and maintenance. Portable generators shall be operated and maintained in accordance with the manufacturer's instructions.

1204.4 Grounding. Portable generators shall be grounded in accordance with NFPA 70.

1204.5 Operating locations. Portable generators shall be only operated outdoors a minimum of 10 ft. (1524 m) from any building openings such as windows and doors or air intakes. Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31 of this Code.

1204.6 Cords and wiring. Extension cords and temporary wiring used to connect portable generators shall be in accordance with Section 604 of this code and shall be provided with GFCI protection.

1204.7 Connections to premise wiring. Connections to a premise wiring system shall comply with all of the following:

1. Power shall not be provided in a manner that "back feeds" receptacles or the premise wiring system.
2. Connection to a premise served by commercial power shall be made through a listed transfer switch installed, used and maintained in accordance with NFPA 70.
3. Connections to buildings not served by commercial power shall comply with NFPA 70.

1204.8 Refueling. Portable generators shall not be refueled while operating.

1204.9 Storage and repair. Storage and repair of fuel fired portable generators shall comply with Section 313.

1204.10 Fire extinguisher. One portable fire extinguisher shall be provided in accordance with Section 906 for an Ordinary (Moderate) hazard Class B and Class C fire hazard, and placed in an approved location.

Revise as follows

3106.6.2 Generators-Portable generators. Generators-Portable generators shall comply with Section 1204. Portable generators shall be installed not less than 10 feet (3048 mm) from combustible materials, and shall be isolated from the public by physical guard, fence or enclosure installed not less than 3 feet (914 mm) away from the internal combustion power source.

3107.16 Separation of generators—Portable generator separation. ~~Generators—Portable generators~~ and other internal combustion power sources shall be separated from tents or membrane structures by not less than 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other *approved* means.

Add new text as follows

SECTION 3307 PORTABLE GENERATORS

3307.1 General. Portable generators used at construction and demolition sites shall comply with Section 1204.

Add new standard(s) follows

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

UL 2201-18:

Standard for Tests for Determining Carbon Monoxide (CO) Emission Rate of Portable Generators

Reason: The use of portable generators is unregulated in the IFC, except for Section 313 storage, use and repair requirements and some Chapter 31 setback requirements. These products are frequently used to provide power at special outdoor events, construction sites, and during power outages, which often occur during and following natural disasters. A 2016 Consumer Product Safety Commission (CPSC) staff report https://www.cpsc.gov/s3fs-public/PGMAsummitCPSCstaffpresentation_2.pdf?utm_source=rss&utm_medium=rss&utm_campaign=Portable%20Generator%20Technical%20Reports indicated that in the

9 year period of 2004 through 2012, there were 8,703 CO injuries and 666 fatalities associated with the use of portable generators. The report also indicated that a typical engine powering a 5 kW portable generator emits a weighted average CO rate of nominally 1500 g/hr, compared to an idling mid-size late 1990's vintage cars that emit 2.4 - 5.4 g/hr of CO. This proposal provides basic safety requirements for the use of portable generators, including the following:

1. 1204.2 requires portable generators to be listed and labeled in accordance with UL 2201 carbon monoxide mitigation requirements, which (1) limit the amount of CO produced by a portable generator, and (2) require the portable generator to shutoff in elevated CO environments. These requirements were developed based on an analysis of the CPSC CO incident data, and are complementary, addressing both indoor misuse and outdoor use incidents. In accordance with UL 2201, the CO emission rate shall not exceed 150 g/h, and the generator shall shutoff at any time when there is a peak 400 ppm CO concentration, or the average CO concentration is greater than 150 ppm during a rolling 600 seconds during the test.
2. 1204.5 includes restrictions on locations where portable generators can be operated to minimize the chance of carbon monoxide poisoning and fires.
3. 1204.7 provides guidance on how power from portable generators can be provided to premise wiring systems. Back feeding receptacles is an unsafe practice which can bypass premise overcurrent protection and create a dangerous situation when local commercial power comes back online. It can also endanger utility workers while they repairing power lines, when they are not expecting any power.
4. 1204.10 requires a portable fire extinguisher be provided where portable generators are used. The sizing and rating complies with NFPA 10 for the hazard classification associated with portable generators fueled with a flammable liquid (gasoline). This is consistent with current portable fire extinguisher requirements for mitigation of potential fire hazards.

Cost Impact: The code change proposal will increase the cost of construction. There could be additional expense for providing portable extinguishers, providing grounding per NFPA 70, providing NFPA 70 compliant connections, and UL 2201 compliant portable generators.

Analysis: A review of the standard proposed for inclusion in the code, UL 2201-18, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F193-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as there were concerns with what separations are appropriate. Discussions surrounded 5 and 10 feet but also concern those may not be correct as well. Also there was concern that the fire extinguisher was not required to have a Class A rating. A reference to NFPA 37 was suggested. (Vote: 9-4)

Assembly Action:

None

F193-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Andrew King, International Association of Fire Chiefs, representing UL LLC (andyk@franklintn.gov); Howard Hopper, representing UL LLC (howard.d.hopper@ul.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

PORTABLE GENERATOR. A mobile internal combustion engine-driven device that provides temporary electrical power. This includes hand portable, wheeled, trailer mounted, and motor vehicle mounted generator sets. It does not include generators in permanent, fixed installations.

1204.1 Portable generators. The use, operation, and maintenance of portable generators shall comply with this section.

1204.2 ~~Carbon monoxide mitigation~~Listing. Portable generators manufactured after January 1, 2021 shall be listed and labeled in accordance with the UL 2201-carbon monoxide mitigation requirements.

1204.5 Operating locations. Portable generators shall be only operated outdoors a minimum of ~~10~~ 5 ft. (1524 ~~mm~~) from any building openings such as windows and doors or air intakes Portable generators shall not be operated within buildings or enclosed areas. Additional separation shall be provided for tents, membrane structures and outdoor assembly events as specified in Chapter 31 of this Code.

1204.10 Fire extinguisher. ~~One A listed~~ portable fire extinguisher complying with Section 906 with a minimum rating of 2-A:20-B:C shall be provided in accordance with Section 906 for an Ordinary (Moderate) hazard Class B and Class C fire hazard, and placed in an approved location not more than 50 feet (15240 mm) from the portable generator.

3106.6.2 ~~Portable generators~~Generators.. ~~Portable generators shall comply with Section 1204. Portable generators shall~~ Generators shall be installed not less than 10 feet (3048 mm) from combustible materials, and shall be isolated from the public by physical guard, fence or enclosure installed not less than 3 feet (914 mm) away from the internal combustion power source. __

3107.16 ~~Portable generator separation~~Separation of generators. ~~Portable generators-Generators~~ and other internal combustion power sources shall be separated from tents or membrane structures by not less than 20 feet (6096 mm) and shall be isolated from contact with the public by fencing, enclosure or other *approved* means.

Commenter's Reason: A few concerns were raised with the original proposal which have been addressed as follows:

There was concern that the definition of portable generator may not adequately identify the type of generators being covered, and to differentiate them from permanently installed fixed generators regulated by NFPA 37. The Portable Generator definition was revised to address these concerns.

The original proposal did not allow existing portable generators not listed to UL 2201 from being used, which was not the intent of the proposal. This was addressed by only requiring UL 2201 listing for portable generators manufactured after January 1, 2021, which will not impact portable generators currently in use or on the market.

There was no disagreement with prohibiting portable generators from being used within buildings or in enclosed spaces, but requiring them to be spaced a minimum 10 ft from windows, doors and air intakes might be problematic based on a buildings location. It was felt that a minimum 5 ft. spacing to windows, doors and air intake openings, combined with UL 2201 listings that significantly limit levels of carbon monoxide in the exhaust provides an acceptable level of safety.

The concern with the portable fire extinguisher not including a Class A rating was addressed with a revision to Section 1204.10. A 50 foot travel distance was also introduced which is consistent with NFPA 10. Specifying that portable extinguishers be provided in an "approved location" was removed since fire code officials are typically not on the job site to approve the portable extinguisher location.

Section 3106.6.2 and 3107.16 reverted to existing language which covered all generators, not just portable generators.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. There could be an additional expense for providing portable extinguishers, providing grounding per NFPA 70, providing NFPA 70 compliant connections, and UL 2201 compliant portable generators.

F193-18

F199-18

IFC: 1204.2.2

Proposed Change as Submitted

Proponent: Joseph Cain, Solar Energy Industries Association (SEIA), representing Solar Energy Industries Association (JoeCainPE@gmail.com)

2018 International Fire Code

Revise as follows

1204.2.2 Emergency escape and rescue openings. ~~Panels and modules installed on Group R-3 buildings~~ Photovoltaic (PV) panel systems shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway of not less than 36 inches (914 mm) wide shall be provided to ~~the~~ not fewer than one emergency escape and rescue ~~opening.~~ opening for each sleeping room.

Reason: Section 1204.2.2 was new in the 2018 IFC, as a result of Proposal F-87 Part 1.

"Panels and modules" is a non-specific reference to solar photovoltaic (PV) systems. This incomplete language does not correlate to terms defined in the IBC. "*Photovoltaic panel system*" is a term defined in the IBC and IRC.

As written in the 2018 IFC, this provision applies only to Group R-3 occupancies. However, IBC and IFC Section 1030.1 also require emergency escape and rescue openings for Group R-2 and Group R-4 occupancies, in certain cases. By removing the R-3 buildings, the access pathway requirement is expanding to any occupancy where emergency escape and rescue openings are required. In those cases where a sleeping room has more than one opening that meets the dimensional criteria for an emergency escape and rescue opening, an access pathway is required to not fewer than one emergency escape and rescue opening for each sleeping room. The language "not fewer than one" is consistent with language found in IBC/IFC Section 1030.1.

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

This proposal clarifies that access pathways are required to emergency escape and rescue openings in any residential occupancy where they are required by IFC Section 1030 and IBC Section 1030. This will neither increase nor decrease the cost of construction.

F199-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved with concern that is difficult to know which emergency escape rescue opening would be needed in a fire and would reduce safety. The removal of Group R-3 was seen as beneficial to apply the provisions more generally. (Vote: 8-5)

Assembly Action:

None

F199-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Joseph H. Cain, Solar Energy Industries Association (SEIA), representing Solar Energy Industries Association (joecainpe@gmail.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1204.2.2 Emergency escape and rescue openings. Photovoltaic (PV) ~~panel systems~~ panels and BIPV modules shall not be placed on the portion of a roof that is below an emergency escape and rescue opening. A pathway of not less than 36 inches (914 mm) wide shall be provided to not fewer than one emergency escape and rescue opening for each sleeping room.

Exception: BIPV systems listed in accordance with Section 690.12(B)(2) of NFPA 70, where the removal or cutting away of portions of the BIPV system during firefighting operations have been determined to not expose a firefighter to electrical shock hazards.

Commenter's Reason: The edit to Photovoltaic (PV) panels and BIPV modules is in response to public testimony during the Committee Action Hearings. These edits are intended to clarify that both roof-mounted PV panel systems and BIPV modules are within the scope of the requirement.

The exception added to this proposal uses language identical to the exception language added in the floor modification to F200-18, which was unanimously Approved as Modified by the IFC Committee.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The public comment and the code change proposal impact only layout of PV system components.

F199-18

F203-18

IFC: 202, 105.6.14 (New), 105.7.2, 105.7.3, 105.7.7 (New), TABLE 903.2.11.6 (IBC: [F] TABLE 903.2.11.6), 907.2.22 (IBC [F] 907.2.22), 907.2.23 (IBC [F] , TABLE 911.1, 1201.1, 1202.1, 1203.2.5 (New), 1203.2.6, 1206, Chapter 80; IBC: [F] TABLE 414.5.1

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

BATTERY TYPES.

Delete without substitution

CAPACITOR ARRAY. An arrangement of individual capacitor modules in close proximity to each other, mounted on storage racks or in cabinets or other enclosures.

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.

ENERGY STORAGE MANAGEMENT SYSTEMS. An electronic system that protects ~~stationary energy storage batteries systems~~ from operating outside their safe operating parameters, and ~~generates an alarm and trouble signal for off normal conditions~~ disconnects electrical power to the ESS or places it in a safe condition if potentially hazardous temperatures or other conditions are detected.

ENERGY STORAGE SYSTEM (ESS).

One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

Add new text as follows

ENERGY STORAGE SYSTEM CABINET. A cabinet containing components of the energy storage system that is included in the UL 9540 listing for the system. Personnel are not able to enter the enclosure, other than reaching in to access components for maintenance purposes.

ENERGY STORAGE SYSTEM COMMISSIONING.

A systematic process that provides documented confirmation that an energy storage system functions according to the intended design criteria and complies with applicable code requirements.

ENERGY STORAGE SYSTEM DECOMMISSIONING.

A systematic process that provides documentation and procedures that allow an energy storage system to be safely de-energized, disassembled, readied for shipment or storage, and removed from the premise in accordance with applicable code requirements.

ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.

An energy storage system that stores energy and produces electricity using chemical reactions. It includes, among others, battery ESS and capacitor ESS.

ENERGY STORAGE SYSTEM, MOBILE.

An energy storage system capable of being moved and utilized for temporary energy storage applications, and not installed as fixed or stationary electrical equipment. The system can include integral wheels for transportation, or be loaded on a trailer and unloaded for charging, storage and deployment.

ENERGY STORAGE SYSTEM, STATIONARY.

An energy storage system installed as fixed or stationary electrical equipment in a permanent location.

ENERGY STORAGE SYSTEM, WALK-IN UNIT.

A pre-fabricated building that contains energy storage systems. It includes doors that provide walk-in access for personnel to maintain, test and service the equipment, and is typically used in outdoor and mobile ESS applications.

Delete without substitution

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.

Add new text as follows

105.6.14 Energy storage systems, mobile. An operational permit is required for mobile energy storage systems regulated by Section 1206.

Delete without substitution

~~**[A] 105.7.2 Battery systems.** A construction permit is required to install stationary storage battery systems regulated by Section 1206.2.~~

~~**[A] 105.7.3 Capacitor energy storage systems.** A construction permit is required to install capacitor energy storage systems regulated by Section 1206.3.~~

Add new text as follows

105.7.7 Energy storage systems. A construction permit is required to install energy storage systems regulated by Section 1206.

**TABLE 903.2.11.6
ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS**

SECTION	SUBJECT
914.2.1	Covered and open mall buildings
914.3.1	High-rise buildings
914.4.1	Atriums
914.5.1	Underground structures
914.6.1	Stages
914.7.1	Special amusement buildings
914.8.2	Airport traffic control towers
914.8.3, 914.8.6	Aircraft hangars
914.9	Flammable finishes
914.10	Drying rooms
914.11.1	Ambulatory care facilities
1029.6.2.3	Smoke-protected assembly seating
1103.5.1	Existing Group A occupancies
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.3	Existing Group I-2 occupancies
1103.5.4	Existing Group I-2, Condition 2 occupancies
1103.5.4	Pyroxylin plastics
<u>Table 1206.7, Table 1206.8, Table 1206.9, Table 1206.10.</u>	<u>Stationary and mobile energy storage systems</u>
2108.2	Dry cleaning plants
2108.3	Dry cleaning machines
2309.3.2.6.2	Hydrogen motor fuel-dispensing area canopies

2404.2	Spray finishing in Group A, E, I or R
2404.4	Spray booths and spray rooms
2405.2	Dip-tank rooms in Group A, I or R
2405.4.1	Dip tanks
2405.9.4	Hardening and tempering tanks
2703.10	HPM facilities
2703.10.1.1	HPM work station exhaust
2703.10.2	HPM gas cabinets and exhausted enclosures
2703.10.3	HPM exit access corridor
2703.10.4	HPM exhaust ducts
2703.10.4.1	HPM noncombustible ducts
2703.10.4.2	HPM combustible ducts
2807.3	Lumber production conveyor enclosures
2808.7	Recycling facility conveyor enclosures
3006.1	Class A and B ovens
3006.2	Class C and D ovens
Table 3206.2	Storage fire protection
3206.4	Storage
3704.5	Storage of more than 1,000 cubic feet of loose combustible fibers
5003.8.4.1	Gas rooms
5003.8.5.3	Exhausted enclosures
5004.5	Indoor storage of hazardous materials
5005.1.8	Indoor dispensing of hazardous materials
5104.4.1	Aerosol product warehouses
5106.3.2	Aerosol display and merchandising areas
5306.2.1	Exterior medical gas storage room
5306.2.2	Interior medical gas storage room
5306.2.3	Medical gas storage cabinet
5606.5.2.1	Storage of smokeless propellant
5606.5.2.3	Storage of small arms primers
5704.3.7.5.1	Flammable and combustible liquid storage rooms
5704.3.8.4	Flammable and combustible liquid storage warehouses
5705.3.7.3	Flammable and combustible liquid Group H-2 or H-3 areas
6004.1.2	Gas cabinets for highly toxic and toxic gas
6004.1.3	Exhausted enclosures for highly toxic and toxic gas
6004.2.2.6	Gas rooms for highly toxic and toxic gas
6004.3.3	Outdoor storage for highly toxic and toxic gas
6504.1.1	Pyroxylin plastic storage cabinets
6504.1.3	Pyroxylin plastic storage vaults
6504.2	Pyroxylin plastic storage and manufacturing

For SI: 1 cubic foot = 0.023 m³.

Revise as follows

907.2.22 ~~Battery rooms~~ Energy storage systems. An automatic smoke detection system ~~or radiant energy detection system~~ shall be installed in ~~rooms, areas and walk-in units~~ containing ~~stationary energy storage battery~~ systems as required in Section ~~1206.2-1206.~~

Delete without substitution

~~907.2.23 Capacitor energy storage systems.~~ An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 1206.3.

**TABLE 911.1
EXPLOSION CONTROL REQUIREMENTS^f**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems
Hazard Category			
Combustible dusts ^a	—	Not required	Required
Cryogenic fluids	Flammable	Not required	Required
Explosives	Division 1.1	Required	Not required
	Division 1.2	Required	Not required
	Division 1.3	Not required	Required
	Division 1.4	Not required	Required
	Division 1.5	Required	Not required
	Division 1.6	Required	Not required
Flammable gas	Gaseous	Not required	Required
	Liquefied	Not required	Required
Flammable liquids	IA ^b	Not required	Required
	IB ^c	Not required	Required
Organic peroxides	Unclassified detonable	Required	Not permitted
	I	Required	Not permitted
Oxidizer liquids and solids	4	Required	Not permitted
Pyrophoric	Gases	Not required	Required
Unstable (reactive)	4	Required	Not permitted
	3 detonable	Required	Not permitted
	3 nondetonable	Not required	Required
Water-reactive liquids and solids	3	Not required	Required
	2 ^e	Not required	Required
Special Uses			
Acetylene generator rooms	—	Not required	Required
<u>Electrochemical energy storage systems^g</u>		<u>Not Required</u>	<u>Required</u>
Grain processing	—	Not required	Required
Liquefied petroleum gas distribution facilities	—	Not required	Required
Where explosion hazards exist ^d	Detonation	Required	Not permitted
	Deflagration	Not required	Required

- a. Combustible dusts that are generated during manufacturing or processing. See definition of "Combustible dust" in Chapter 2.
- b. Storage or use.
- c. In open use or dispensing.
- d. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- e. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- f. Explosion venting is not required for Group H-5 Fabrication Areas complying with Chapter 27 and the International Building Code.
- g. Where explosion control is required in Section 1206.6.

Revise as follows

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation ~~and maintenance, maintenance,~~ repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.

1202.1 Definitions. The following terms are defined in Chapter 2:
BATTERY SYSTEM, STATIONARY STORAGE.

BATTERY TYPES.

1. ~~Lead-acid battery.~~

1. CAPACITOR

~~ARRAY.CAPACITOR~~

1. ENERGY STORAGE SYSTEM.

CRITICAL CIRCUIT.

EMERGENCY POWER SYSTEM.

ENERGY STORAGE MANAGEMENT SYSTEMS.

ENERGY STORAGE SYSTEM.

ENERGY STORAGE SYSTEM CABINET.

ENERGY STORAGE SYSTEM COMMISSIONING.

ENERGY STORAGE SYSTEM DECOMMISSIONING.

ENERGY STORAGE SYSTEM, ELECTROCHEMICAL.

ENERGY STORAGE SYSTEM, MOBILE.

ENERGY STORAGE SYSTEM, WALK-IN UNIT.

FUEL CELL POWER SYSTEM, STATIONARY.

STANDBY POWER SYSTEM.~~STATIONARY BATTERY ARRAY.~~

Add new text as follows

1203.2.5 Exhaust ventilation. Standby power shall be provided for mechanical exhaust ventilation systems as required in Section 1206.6.1.2.1. The system shall be capable of powering the required load for a duration of not less than two hours.

1203.2.6 Gas detection systems. Emergency power shall be provided for gas detection systems where required by Sections 1203.2.9 and ~~1203.2.16~~ 1203.2.16. Standby power shall be provided for gas detection systems where required by ~~Section 916.5~~ Sections 916.5 and 1206.6.2.2.4.

SECTION 1206 ELECTRICAL ENERGY STORAGE SYSTEMS (ESS)

1206.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

1206.1.1 Scope. ESS having capacities exceeding the values shown in Table 1206.1 shall comply with this section.

1206.1.2 Permits. Permits shall be obtained for ESS as follows:

1. Construction permits shall be obtained for stationary ESS installations and for mobile ESS charging and storage installations covered by 1206.10.1. Permits shall be obtained in accordance with Sections 105.7.7.
2. Operational permits shall be obtained for mobile ESS deployment operations covered by Section 1206.10.3. Permits shall be obtained in accordance with Sections 105.6.14.

**TABLE 1206.1
ENERGY STORAGE SYSTEM (ESS) THRESHOLD QUANTITIES**

TECHNOLOGY	ENERGY CAPACITY ^a
<u>Lead acid batteries, all types</u>	<u>70 KWh (252 Megajoules) ^c</u>
<u>Nickel cadmium batteries (Ni-Cd)</u>	<u>70 KWh (252 Megajoules)</u>
<u>Nickel metal hydride (Ni-MH)</u>	<u>70 KWh (252 Megajoules)</u>
<u>Lithium-ion batteries</u>	<u>20 KWh (72 Megajoules)</u>
<u>Flow batteries ^b</u>	<u>20 KWh (72 Megajoules)</u>
<u>Other battery technologies</u>	<u>10 KWh (36 Megajoules)</u>
<u>Capacitor ESS</u>	<u>3 KWh (10.8 Mega joules)</u>
<u>Other electrochemical ESS technologies</u>	<u>3 KWh (10.8 Mega joules)</u>

a. Energy capacity is the total energy capable of being stored (nameplate rating), not the usable energy rating. For units 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. 50 gallons of lead acid battery electrolyte shall be considered equivalent to 70 KWh.

1206.1.3 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room or area in which the ESS is to be installed.
2. Details on the hourly fire-resistance ratings of assemblies enclosing the ESS.
3. The quantities and types of ESS to be installed.
4. Manufacturer's specifications, ratings and listings of each ESS.
5. Description of energy (battery) management systems and their operation.
6. Location and content of required signage.
7. Details on fire suppression, smoke or fire detection, thermal management, ventilation, exhaust and deflagration venting systems, if provided.
8. Support arrangement associated with the installation, including any required seismic restraint.
9. A commissioning plan complying with 1206.2.1.
10. A decommissioning plan complying with 1206.2.3.

1206.1.4 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. Where ESS technologies not specifically identified in Table 1206.1 are provided.
2. More than one ESS technology is provided in a room or enclosed area where there is a potential for adverse interaction between technologies.
3. Where allowed as a basis for increasing maximum allowable quantities. See Section 1206.5.2.

1206.1.4.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes. Only single failure modes shall be considered.

1. A thermal runaway condition in a single ESS rack, module or unit.
2. Failure of any battery (energy) management system.
3. Failure of any required ventilation or exhaust system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the ESS.
6. Failure of the smoke detection, fire detection, fire suppression, or gas detection system.
7. Required spill neutralization not being provided or failure of a required secondary containment system.

1206.1.4.2 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 will be contained within unoccupied ESS rooms or areas for the minimum duration of the fire-resistance rated separations identified in Section 1206.7.4.
2. Fires in occupied work centers will be detected in time to allow occupants within the room or area to safely evacuate.
3. Toxic and highly toxic gases released during fires will not reach concentrations in excess of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate occupants from any affected area.
4. Flammable gases released from ESS during charging, discharging and normal operation will not exceed 25 percent of their lower flammability limit (LFL).
5. Flammable gases released from ESS during fire, overcharging and other abnormal conditions will be controlled through the use of ventilation of the gases preventing accumulation or by deflagration venting.

1206.1.4.3 Additional protection measures. Construction, equipment and systems that are required for the ESS to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section 1206 shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters.

1206.1.5 Large scale fire test. Where required elsewhere in Section 1206, large scale fire testing shall be conducted on a representative ESS in accordance with UL 9540A. The testing shall be conducted or witnessed and reported by an approved testing laboratory and show that a fire involving one ESS will not propagate to an adjacent ESS, and where installed within buildings, enclosed areas and walk-in units will be contained within the room, enclosed area or walk-in unit for a duration equal to the fire resistance rating of the room separation specified in Section 1206.7.4. The test report shall be provided to the fire code official for review and approval in accordance with Section 104.7.2.

1206.1.6 Fire remediation. Where a fire or other event has damaged the ESS and ignition or re-ignition of the ESS is possible, the system owner, agent, or lessee shall take the following actions, at their expense, to mitigate the hazard or remove damaged equipment from the premises to a safe location.

1206.1.6.1 Fire mitigation personnel. Where, in the opinion of the fire code official, it is essential for public safety that trained personnel be on site to respond to possible ignition or re-ignition of a damaged ESS, the system owner, agent or lessee shall immediately dispatch one or more fire mitigation personnel to the premise, as required and approved, at their expense. These personnel shall remain on duty continuously after the fire department leaves the premise until the damaged energy storage equipment is removed from the premises, or earlier if the fire code official indicates the public safety hazard has been abated.

1206.1.6.2 Duties. On-duty fire mitigation personnel shall have the following responsibilities:

1. Keep diligent watch for fires, obstructions to means of egress and other hazards.
2. Immediately contact the fire department if their assistance is needed to mitigate any hazards or extinguish fires.
3. Take prompt measures for remediation of hazards in accordance with the decommissioning plan in Section 1206.2.3.
4. Take prompt measures to assist in the evacuation of the public from the structures.

1206.2 Commissioning, decommissioning, operation and maintenance. Commissioning, decommissioning, operation and maintenance shall be conducted in accordance with this section.

1206.2.1 Commissioning. Commissioning of newly installed ESS, and existing ESS that have been retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been approved prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning including the personnel intended to accomplish each of the activities.
2. A listing of the specific ESS and associated components, controls and safety related devices to be tested, a description of the tests to be performed and the functions to be tested.
3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.
4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.
5. Verification that required equipment and systems are installed in accordance with the approved plans and specifications.
6. Integrated testing for all fire and safety systems.
7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.
8. Preparation and delivery of operation and maintenance documentation.
9. Training of facility operating and maintenance staff.
10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.
11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.
12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

Exception: Commissioning shall not be required for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. However a decommissioning plan shall be provided and maintained whenever required by the fire code official.

1206.2.1.1 Initial acceptance testing. During the commissioning process an ESS shall be evaluated for proper operation in accordance with the manufacturer's instructions and the commissioning plan prior to final approval.

1206.2.1.2 Commissioning report. A report describing the results of the system commissioning and including the results of the initial acceptance testing required in Section 1206.2.1.1 shall be provided to code official prior to final inspection and approval and maintained at an approved on-site location.

1206.2.2 Operation and maintenance. An operating and maintenance manual shall be provided to both the ESS owner or their authorized agent and the ESS operator before the ESS is put into operation and shall include the following:

1. Manufacturer's operation manuals and maintenance manuals for the entire ESS or for each component of the system requiring maintenance, that clearly identify the required routine maintenance actions.
2. Name, address and phone number of a service agency that has been contracted to service the ESS and its associated safety systems.
3. Maintenance and calibration information, including wiring diagrams, control drawings, schematics, system programming instructions and control sequence descriptions, for all energy storage control systems.
4. Desired or field-determined control set points that are permanently recorded on control drawings at control devices or, for digital control systems, in system programming instructions.
5. A schedule for inspecting and recalibrating all ESS controls.
6. A service record log form that lists the schedule for all required servicing and maintenance actions and space for logging such actions that are completed over time and retained on site.

The ESS shall be operated and maintained in accordance with the manual and a copy of the manual shall be retained at an approved onsite location.

1206.2.2.1 Ongoing inspection and testing. Systems that monitor and protect the ESS installation shall be inspected and tested in accordance with the manufacturer's instructions and the operating and maintenance manual. Inspection and testing records shall be maintained in the operation and maintenance manual.

1206.2.3 Decommissioning. The code official shall be notified prior to decommissioning of an ESS. Decommissioning shall be performed in accordance with the decommissioning plan that includes the following:

1. A narrative description of the activities to be accomplished for removing the ESS from service, and from the facility in which it is located.
2. A listing of any contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

1206.3 Equipment. ESS equipment shall be in accordance with Sections 1206.3.1 through 1206.3.9

1206.3.1 Energy storage system listings. ESS shall be listed in accordance with UL 9540.

Exception: Lead-acid and nickel cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76 are not required to be listed.

1206.3.2 Equipment listing. Chargers, inverters, energy storage management systems shall be covered as part of the UL 9540 listing or shall be listed separately.

1206.3.3 Utility interactive systems. 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.

1206.3.4 Energy storage management system. Where required by the ESS listing an approved energy storage management system shall be provided that monitors and balances cell voltages, currents and temperatures within the manufacturer's specifications. The system shall disconnect electrical connections to the ESS or otherwise place it in a safe condition if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.

1206.3.5 Enclosures. Enclosures of ESS shall be of noncombustible construction.

1206.3.6 Repairs. Repairs of ESS shall only be done by qualified personnel. Repairs with other than identical parts shall be considered retrofitting and comply with Section 1206.3.7. Repairs shall be documented in the service records log.

1206.3.7 Retrofits. Retrofitting of an existing ESS shall comply with the following:

1. A construction permit shall be obtained in accordance with Section 105.7.7.
2. New batteries, battery modules, capacitors and similar ESS components shall be listed in accordance with UL 1973.
3. Battery management and other monitoring systems shall be connected and installed in accordance with the manufacturer's instructions.
4. The overall installation shall continue to comply with UL 9540 listing requirements, where applicable.
5. Systems that have been retrofitted shall be commissioned in accordance with Section 1206.2.1.
6. Retrofits shall be documented in the service records log.

1206.3.7.1 Retrofitting Lead Acid and Nickel Cadmium. Section 1206.3.7 shall not apply to retrofitting of lead acid and nickel cadmium batteries with other lead acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

1206.3.8 Replacements. Replacements of ESS shall be considered new ESS installations and shall comply with the provisions of Section 1206 as applicable to new ESS. The ESS being replaced shall be decommissioned in accordance with Section 1206.2.3.

1206.3.9 Reused and repurposed equipment. Equipment and materials shall only be reused or reinstalled as permitted in Section 104.7.1. Storage batteries previously used in other applications, such as electric vehicle propulsion, shall not be reused in applications regulated by Chapter 12, unless (1) approved by the fire code official and (2) the equipment is refurbished by a battery refurbishing company approved in accordance with UL 1974.

1206.4 General installations requirements. Stationary and mobile ESS shall comply with the requirements of section 1206.4.1 through 1206.4.12.

1206.4.1 Electrical disconnects. Where the ESS disconnecting means is not within sight of the main electrical service disconnecting means, placards or directories shall be installed at the location of the main electrical service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

Exception: Electrical disconnects for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC shall be permitted to have electrical disconnects signage in accordance with NFPA 76.

1206.4.2 Working clearances. Access and working space shall be provided and maintained about all electrical equipment to permit ready and safe operation and maintenance of such equipment in accordance with NFPA 70 and the manufacturer's instructions.

1206.4.3 Fire-resistance rated separations. Rooms and other indoor areas containing ESS shall be separated from other areas of the building in accordance with Section 1206.7.4. ESS shall be permitted to be in the same room with the equipment they support.

1206.4.4 Seismic and structural design. Stationary ESS 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.

1206.4.5 Vehicle impact protection. Where ESS are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

1206.4.6 Combustible storage. Combustible materials shall not be stored in ESS rooms, areas, or walk-in units. Combustible materials in occupied work centers covered by Section 1206.4.10 shall be stored at least 3 feet (914 mm) from ESS cabinets.

1206.4.7 Toxic and highly toxic gases. ESS that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall be provided with a hazardous exhaust system in accordance with Section 502.8 of the International Mechanical Code.

1206.4.8 Signage. Approved signs shall be provided on or adjacent to all entry doors for ESS rooms or areas and on enclosures of ESS cabinets and walk-in units located outdoors, on rooftops or in open parking garages. Signs designed to meet both the requirements of this section and NFPA 70 shall be permitted. The signage shall include the following or equivalent.

1. "Energy Storage System", "Battery Storage System", "Capacitor Energy Storage System", or the equivalent.
2. The identification of the electrochemical ESS technology present.
3. "Energized electrical circuits"
4. If water reactive electrochemical ESS are present the signage shall include "APPLY NO WATER"
5. Current contact information, including phone number, for personnel authorized to service the equipment and for fire mitigation personnel required by Section 1206.1.6.1.

Exception: Existing electrochemical ESS shall be permitted to include the signage required at the time they were installed.

1206.4.9 Security of installations. Rooms, areas and walk-in units in which electrochemical ESS are located shall be secured against unauthorized entry and safeguarded in an approved manner. Security barriers, fences, landscaping, and other enclosures shall not inhibit the required air flow to or exhaust from the electrochemical ESS and its components.

1206.4.10 Occupied work centers. Electrochemical ESS located in rooms or areas occupied by personnel not directly involved with maintenance, service and testing of the systems shall comply with the following.

1. Electrochemical ESS located in occupied work centers shall be housed in locked noncombustible cabinets or other enclosures to prevent access by unauthorized personnel.
2. Where electrochemical ESS are contained in cabinets in occupied work centers, the cabinets shall be located within 10 feet (3048 mm) of the equipment that they support.
3. Cabinets shall include signage complying with Section 1206.4.8.

1206.4.11 Open rack installations. Where electrochemical ESS are installed in a separate equipment room and only authorized personnel have access to the room, they shall be permitted to be installed on an open rack for ease of maintenance.

1206.4.12 Walk-in units. Walk-in units shall only be entered for inspection, maintenance and repair of ESS units and ancillary equipment, and shall not be occupied for other purposes.

1206.5 Electrochemical ESS Protection. The protection of electrochemical ESS shall be in accordance with Sections

1206.5.1 through 1206.5.8 where required by Section 1206.7 through 1206.10.

1206.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 KWh (180 Mega joules). Each group shall be separated a minimum three feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. The fire code official is authorized to approve larger capacities or smaller separation distances based on large scale fire testing complying with Section 1206.1.5.

1206.5.2 Maximum allowable quantities. Fire areas within rooms, areas and walk-in units containing electrochemical ESS shall not exceed the maximum allowable quantities in Table 1206.5.

Exceptions:

1. Where approved by the fire code official, rooms, areas and walk-in units containing electrochemical ESS that exceed the amounts in Table 1206.5 shall be permitted based on a hazardous mitigation analysis in accordance with Section 1206.1.4 and large scale fire testing complying with Section 1206.1.5.
2. Lead-acid and nickel cadmium battery systems installed in facilities under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
3. Dedicated use buildings in compliance with Section 1206.7.1.

1206.5.2.1 Mixed electrochemical energy systems. Where rooms, areas and walk-in units contain different types of electrochemical energy technologies, the total aggregate quantities of the systems shall be determined based on the sum of percentages of each technology type quantity divided by the maximum allowable quantity of each technology type. The sum of the percentages shall not exceed 100 percent of the maximum allowable quantity.

**TABLE 1206.5
MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS**

TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES ^a
STORAGE BATTERIES	
Lead acid, all types	Unlimited
Nickel cadmium (Ni-Cd)	Unlimited
Nickel metal hydride (Ni-MH)	Unlimited
Lithium-ion	600 KWh
Flow batteries ^b	600 KWh
Other battery technologies	200 KWh
CAPACITORS	
All types	20 KWh
OTHER ELECTROCHEMICAL ESS	
All types	20 KWh

a. For electrochemical ESS units rated in Amp-Hours, KWh shall equal rated voltage times the Amp-hour rating divided by 1000.

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies.

1206.5.3 Elevation. Electrochemical ESS shall not be located in the following areas:

1. Where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or
2. Where the floor is located below the lowest level of exit discharge.

Exceptions:

1. Lead acid and Nickel cadmium battery systems less than 50 VAC and 60 VDC installed in facilities under the exclusive control of communications utilities in accordance with NFPA 76.
2. Where approved, installations shall be permitted in underground vaults complying with NFPA 70, Article 450, Part III.
3. Where approved by the fire code official, installations shall be permitted on higher and lower floors.

1206.5.4 Fire detection. An approved automatic smoke detection system or radiant energy-sensing fire detection system complying with Section 907.2 shall be installed in rooms, indoor areas, and walk-in units containing electrochemical ESS. An approved radiant energy-sensing fire detection system shall be installed to protect open parking garage and rooftop installations. Alarm signals from detection systems shall be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or where approved to a constantly attended location.

1206.5.4.1 System status. Where required by the fire code official, visible annunciation shall be provided on cabinet exteriors or in other approved locations to indicate that potentially hazardous conditions associated with the ESS exist.

1206.5.5 Fire suppression systems. Rooms and areas within buildings and walk-in units containing electrochemical ESS shall be protected by an automatic fire suppression system designed and installed in accordance with one of the following:

1. An automatic sprinkler systems designed and installed in accordance with Section 903.3.1.1 with a minimum density of 0.3 gpm/ft.² based on the fire area or 2,500 ft.² design area, whichever is smaller.
2. Where approved, an automatic sprinkler system designed and installed in accordance with Section 903.3.1.1 with a sprinkler hazard classification based on large scale fire testing complying with Section 1206.1.5.
3. The following alternate automatic fire extinguishing systems designed and installed in accordance with Section 904, provided the installation is approved by the fire code official based on large scale fire testing complying with Section 1206.1.5

NFPA 12, Standard on Carbon Dioxide Extinguishing Systems
NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection
NFPA 750, Standard on Water Mist Fire Protection Systems
NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems
NFPA 2010, Standard for Fixed Aerosol Fire-Extinguishing Systems

Exception: Fire suppression systems for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that operate at less than 50 VAC and 60 VDC shall be provided where required by NFPA 76.

1206.5.5.1 Water reactive systems. Electrochemical ESS that utilize water reactive materials shall be protected by an approved alternative automatic fire-extinguishing system in accordance with Section 904, where the installation is approved by the fire code official based on large scale fire testing complying with Section 1206.1.5.

1206.5.6 Maximum enclosure size. Outdoor walk-in units housing ESS shall not exceed 53 feet by 8 feet by 9.5 feet high. Walk-in units that exceed these dimensions shall be considered indoor installations and comply with the requirements in Section 1206.7.

1206.5.7 Vegetation control. Areas within 10 feet (3 m) on each side of outdoor ESS shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire.

1206.5.8 Means of egress separation. ESS located outdoors and in open parking garages 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 a reduced separation distance if large scale fire testing complying with Section 1206.1.5 is provided that shows that a fire involving the ESS will not adversely impact occupant egress.

1206.6 Electrochemical ESS technology specific protection. Electrochemical ESS installations shall comply with the requirements of this section in accordance with the applicable requirements of Table 1206.6.

**TABLE 1206.6
ELECTROCHEMICAL ESS TECHNOLOGY SPECIFIC REQUIREMENTS**

COMPLIANCE REQUIRED ^b	BATTERY TECHNOLOGY				OTHER ESS AND BATTERY TECHNOLOGIES ^b	CAPACITOR ESS ^b
	Lead-acid	Ni-Cad and Ni-MH	Lithium-ion	Flow		
1206.6.1 Exhaust ventilation	Yes	Yes	No	Yes	Yes	Yes
1206.6.2 Spill control and neutralization	Yes ^c	Yes ^c	No	Yes	Yes	Yes
1206.6.3 Explosion control	Yes ^a	Yes ^a	Yes	No	Yes	Yes
1206.6.4 Safety caps	Yes	Yes	No	No	Yes	Yes
1206.6.5 Thermal runaway	Yes	Yes	Yes ^d	No	Yes ^d	Yes

a. Not required for lead-acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.7.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented (i.e. flooded) type nickel cadmium and lead acid batteries.

d. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

1206.6.1 Exhaust ventilation. Where required by Table 1206.6 or elsewhere in this code, exhaust ventilation of rooms, areas, and walk-in units containing electrochemical ESS shall be provided in accordance with the International Mechanical Code and Section 1206.6.1.1 or 1206.6.1.2.

1206.6.1.1 Ventilation based upon LFL. The exhaust ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammable limit (LFL) of the total volume of the room, area, or walk-in unit during the worst-case event of simultaneous charging of batteries at the maximum charge rate, in accordance with nationally recognized standards.

1206.6.1.2 Ventilation based upon exhaust rate. Mechanical exhaust ventilation shall be provided at a rate of not less than 1 ft³/min/ft² (5.1 L/sec/m²) of floor area of the room, area, or walk-in unit. The ventilation shall be either continuous or shall be activated by a gas detection system in accordance with Section 1206.6.1.2.4.

1206.6.1.2.1 Standby power. Mechanical exhaust ventilation shall be provided with a minimum of two hours of standby power in accordance with Section 1203.2.5.

1206.6.1.2.2 Installation instructions. Required mechanical exhaust ventilation systems shall be installed in accordance with the manufacturer's installation instructions and the International Mechanical Code.

1206.6.1.2.3 Supervision. Required mechanical exhaust ventilation systems shall be supervised by an approved central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible signal at an approved constantly attended on-site location.

1206.6.1.2.4 Gas detection system. Where required by Section 1206.6.1.2, rooms, areas, and walk-in units containing ESS shall be protected by an approved continuous gas detection system that complies with Section 916 and with the following:

1. The gas detection system shall be designed to activate the mechanical ventilation system when the level of flammable gas in the room, area, or walk-in unit exceeds 25 percent of the LFL.
2. The mechanical ventilation system shall remain on until the flammable gas detected is less than 25 percent of the LFL.
3. The gas detection system shall be provided with a minimum of 2 hours of standby power in accordance with Section 1203.2.6.
4. Failure of the gas detection system shall annunciate a trouble signal at an approved central station, proprietary or remote station service in accordance with NFPA 72, or shall initiate an audible and visible trouble signal at an approved constantly attended on-site location.

1206.6.2 Spill control and neutralization. Where required by Table 1206.6 or elsewhere in this code, areas containing free-flowing liquid electrolyte or hazardous materials shall be provided with spill control and neutralization in accordance with this section.

1206.6.2.1 Spill control. Spill control shall be provided to prevent the flow of liquid electrolyte or hazardous materials to adjoining rooms or areas. The method shall be capable of containing a spill from the single largest battery or vessel.

1206.6.2.2 Neutralization. An approved method to neutralize spilled liquid electrolyte shall be provided that is capable of neutralizing a spill from the largest battery or vessel to a pH between 5.0 and 9.0.

1206.6.3 Explosion control. Where required by Table 1206.6 or elsewhere in this code, explosion control complying with Section 911 shall be provided for rooms, areas or walk-in units containing electrochemical ESS technologies.

Exceptions:

1. Where approved, explosion control is permitted to be waived by the fire code official based on large scale fire testing complying with Section 1206.1.5 which demonstrates that flammable gases are not liberated from electrochemical ESS cells or modules where tested in accordance with UL 9540A.
2. Where approved, explosion control is permitted to be waived by the fire code official based on documentation provided in accordance with Section 104.7 that demonstrates that the electrochemical ESS technology to be used does not have the potential to release flammable gas concentrations in excess of 25 percent of the LFL anywhere in the room, area, walk-in unit or structure under thermal runaway or other fault conditions.

1206.6.4 Safety caps. Where required by Table 1206.6 or elsewhere in this code, vented batteries and other ESS shall be provided with flame-arresting safety caps.

1206.6.5 Thermal runaway. Where required by Table 1206.6 or elsewhere in this code, batteries and other ESS shall be provided with a listed device or other approved method to prevent, detect and minimize the impact of thermal runaway.

1206.7 Indoor installations. Indoor ESS installations shall be in accordance with Sections 1206.7.1 through 1206.7.4.

1206.7.1 Dedicated use buildings. For the purpose of Table 1206.7 dedicated use ESS buildings shall be classified as Group F-1 occupancies and comply with all the following:

1. The building shall only be used for ESS, electrical energy generation, and other electrical grid related operations.
2. Occupants in the rooms and areas containing ESS are limited to personnel that operate, maintain, service, test and repair the ESS and other energy systems.
3. No other occupancy types shall be permitted in the building.
4. Administrative and support personnel shall be permitted in areas within the buildings that do not contain ESS, provided:

4.1 The areas do not occupy more than 10 percent of the building area of the story in which they are located.

4.2 A means of egress is provided from the incidental use areas to the public way that does not require occupants to traverse through areas containing ESS or other energy system equipment.

1206.7.2 Non-dedicated use buildings. For the purpose of Table 1206.7 non-dedicated use buildings include all buildings that contain ESS and do not comply with Section 1206.7.2 dedicated use building requirements.

**TABLE 1206.7
INDOOR ESS INSTALLATIONS**

COMPLIANCE REQUIRED	DEDICATED USE BUILDINGS ^a	NON-DEDICATED USE BUILDINGS ^b
1206.4 General installation requirements	Yes	Yes
1206.5.1 Size and separation	Yes	Yes
1206.5.2 Maximum allowable quantities	No	Yes
1206.5.3 Elevation	Yes	Yes
1206.5.4 Smoke and automatic fire detection	Yes ^c	Yes
1206.5.5 Fire suppression systems	Yes ^d	Yes
1206.7.3 Dwelling units and sleeping units	NA	Yes
1206.7.4 Fire-resistance rated separations	Yes	Yes
1206.6 Technology specific protection	Yes	Yes

NA = Not allowed.

a. See Section 1206.7.1.

b. See Section 1206.7.2.

c. Where approved by the fire code official, alarm signals are not required to be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or a constantly attended location where local fire alarm annunciation is provided and trained personnel are always present.

d. Where approved by the fire code official, fire suppression systems are permitted to be omitted in dedicated use buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

1206.7.3 Dwelling units and sleeping units. ESS shall not be installed in sleeping units or in habitable spaces of dwelling units.

1206.7.4 Fire-resistance rated separations. Rooms and areas containing ESS shall include fire-resistance rated separations as follows:

1. In dedicated use buildings, rooms and areas containing ESS shall be separated from areas in which administrative and support personnel are located.
2. In non-dedicated use buildings, rooms and areas containing ESS shall be separated from other areas in the building.

Separation shall be provided by 2 hour rated fire barriers constructed in accordance with Section 707 of the International Building Code and 2 hour rated horizontal assemblies constructed in accordance with Section 711 of the International Building Code, as appropriate.

1206.8 Outdoor installations. Outdoor installations shall be in accordance with Sections 1206.8.1 through 1206.8.3.

1206.8.1 Remote outdoor installations. For the purpose of Table 1206.8, remote outdoor installations include ESS located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

1206.8.2 Installations near exposures. For the purpose of Table 1206.8, installations near exposures include all outdoor ESS installations that do not comply with Section 1206.8.1 remote outdoor location requirements.

**TABLE 1206.8
OUTDOOR ESS INSTALLATIONS ^a**

COMPLIANCE REQUIRED	REMOTE INSTALLATIONS ^a	INSTALLATIONS NEAR EXPOSURES ^b
<u>1206.4 All ESS installations</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.5.1 Size and separation</u>	<u>No</u>	<u>Yes ^c</u>
<u>1206.5.2 Maximum allowable quantities</u>	<u>No</u>	<u>Yes</u>
<u>1206.5.4 Smoke and automatic fire detection</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.5.5 Fire suppression systems</u>	<u>Yes ^d</u>	<u>Yes</u>
<u>1206.5.6 Maximum enclosure size</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.5.7 Vegetation control</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.5.8 Means of egress separation</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.8.3 Clearance to exposures</u>	<u>Yes</u>	<u>Yes</u>
<u>1206.6 Technology specific protection</u>	<u>Yes</u>	<u>Yes</u>

a. See Section 1206.8.1.

b. See Section 1206.8.2.

c. In outdoor walk-in units, spacing is not required between ESS units and the walls of the enclosure.

d. Where approved by the fire code official, fire suppression systems are permitted to be omitted.

1206.8.3 Clearance to exposures. ESS located outdoors shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and extending 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.
2. Clearances to buildings are permitted to be reduced to 3 feet (914 mm) where noncombustible exterior walls with no openings or combustible overhangs are provided on the wall adjacent to the ESS and the fire-resistance rating of the exterior wall is a minimum 2 hours.
3. Clearances to buildings are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS, and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section 1206.1.5.

1206.9 Special installations. Rooftop and open parking garage ESS installations shall comply with Sections 1206.9.1 through 1206.9.6.

1206.9.1 Rooftop installations. For the purpose of Table 1206.9, rooftop ESS installations are those located on the roofs of buildings.

1206.9.2 Open parking garage installations. For the purpose of Table 1206.9, open parking garage ESS installations are those located in a structure or portion of a structure that complies with Section 406.5 of the International Building Code.

**TABLE 1206.9
SPECIAL ESS INSTALLATIONS**

COMPLIANCE REQUIRED	ROOFTOPS ^a	OPEN PARKING GARAGES ^b
1206.4 All ESS installations	Yes	Yes
1206.5.1 Size and separation	Yes	Yes
1206.5.2 Maximum allowable quantities	Yes	Yes
1206.5.4 Smoke and automatic fire detection	Yes	Yes
1206.5.6 Maximum enclosure size	Yes	Yes
1206.5.8 Means of egress separation	Yes	Yes
1206.9.3 Clearance to exposures	Yes	Yes
1206.9.4 Fire suppression systems	Yes	Yes
1206.9.5 Rooftop installations	Yes	No
1206.9.6 Open parking garage installations	No	Yes
1206.6 Technology specific protection	Yes	Yes

a. See Section 1206.9.1.

b. See Section 1206.9.2.

1206.9.3 Clearance to exposures. ESS located on rooftops and in open parking garages shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Buildings, except the building on which rooftop ESS is mounted
2. Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed
3. Lot lines
4. Public ways
5. Stored combustible materials
6. Locations where motor vehicles can be parked
7. Hazardous materials
8. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and extending 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.
2. Clearances are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section 1206.1.5.

1206.9.4 Fire suppression systems. ESS located in walk-in units on rooftops or in walk-in units in open parking garages shall be provided with automatic fire suppression systems within the ESS enclosure in accordance with Section 1206.5.5. Areas containing ESS other than walk-in units in open parking structures on levels not open above to the sky shall be provided with an automatic fire suppression system complying with Section 1206.5.5. Exception: A fire suppression system is not required in open parking garages if large scale fire testing complying with Section 1206.1.5 is provided that shows that a fire will not impact the exposures in Section 1206.9.3.

1206.9.5 Rooftop installations. ESS and associated equipment that are located on rooftops and not enclosed by building construction shall comply with the following:

1. Stairway access to the roof for emergency response and fire department personnel shall be provided either through a bulkhead from the interior of the building or a stairway on the exterior of the building.
2. Service walkways at least 5 feet (1524 mm) in width shall be provided for service and emergency personnel from the point of access to the roof to the system.
3. ESS and associated equipment shall be located from the edge of the roof a distance equal to at least the height of the system, equipment, or component but not less than 5 feet (1.5 m).
4. The roofing materials under and within 5 feet (1524 mm) horizontally from an ESS or associated equipment shall be noncombustible or shall have a Class A rating when tested in accordance with ASTM E108 or UL 790.
5. A Class I standpipe outlet shall be installed at an approved location on the roof level of the building or in the stairway bulkhead at the top level.
6. The ESS shall be the minimum of 10 feet from the fire service access point on the roof top.

1206.9.6 Open parking garages. ESS and associated equipment that are located in open parking garages shall comply with all of the following:

1. ESS shall not be located within 50 feet (15,240 mm) of air inlets for building HVAC systems.

Exception: This distance shall be permitted to be reduced to 25 feet (7.620 mm) if the automatic fire alarm system monitoring the radiant-energy sensing detectors de-energizes the ventilation system connected to the air intakes upon detection of fire.

2. ESS shall not be located within 25 feet (7620 mm) of exits leading from the attached building where located on a covered level of the parking structure not directly open to the sky above.
3. An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of the ESS.

1206.10 Mobile ESS equipment and operations. Mobile ESS equipment and operations shall comply with Sections 1206.10.1 through 1206.10.7.7

1206.10.1 Charging and storage. For the purpose of Section 1206.10, charging and storage covers the operation where mobile ESS are charged and stored so they are ready for deployment to another site, and where they are charged and stored after a deployment.

1206.10.2 Deployment. For the purpose of Section 1206.10, deployment covers operations where mobile ESS are located at a site other than the charging and storage site and are being used to provide power.

1206.10.3 Permits. Construction and operational permits shall be provided for charging and storage of mobile ESS and operational permits shall be provided for deployment of mobile ESS as required by Section 1206.1.2.

1206.10.4 Construction documents. Construction documents complying with Section 1206.3 shall be provided with the construction permit application for mobile ESS charging and storage locations.

1206.10.4.1 Deployment documents. The following information shall be provided with the operation permit applications for mobile ESS deployments:

1. Relevant information for the mobile ESS equipment and protection measures in the construction documents required by Section 1206.1.3.
2. Location and layout diagram of the area in which the mobile ESS is to be deployed, including a scale diagram of all nearby exposures.
3. Location and content of signage, including no smoking signs.
4. Description of fencing to be provided around the ESS, including locking methods.
5. Details on fire suppression, smoke and automatic fire detection, system monitoring, thermal management, exhaust ventilation, and explosion control, if provided.
6. For deployment, the intended duration of operation, including anticipated connection and disconnection times and dates.
7. Location and description of local staging stops during transit to the deployment site. See Section 1206.10.8.5.
8. Description of the temporary wiring, including connection methods, conductor type and size, and circuit overcurrent protection to be provided.
9. Description of how fire suppression system connections to water supplies or extinguishing agents are to be provided.
10. Contact information for personnel who are responsible for maintaining and servicing the equipment, and responding to emergencies as required by Section 1206.1.6.1.

1206.10.5 Approved locations. Locations where mobile ESS are charged, stored and deployed shall be restricted to the locations established on the construction and operational permits.

1206.10.6 Charging and storage. Installations where mobile ESS are charged and stored shall be treated as permanent ESS indoor or outdoor installations, and shall comply with the following sections, as applicable:

1. Indoor charging and storage shall comply with Section 1206.7.
2. Outdoor charging and storage shall comply with Section 1206.8.
3. Charging and storage on rooftops and in open parking garages shall comply with Section 1206.9.

Exceptions:

1. Electrical connections shall be permitted to be made using temporary wiring complying with the manufacturer's instructions, the UL 9540 listing, and NFPA 70.
2. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

1206.10.7 Deployed mobile ESS requirements. Deployed mobile ESS equipment and operations shall comply with this section and Table 1206.10.

1206.10.7.1 Duration. The duration of mobile ESS deployment shall not exceed 30 days.

Exceptions:

1. Mobile ESS deployments that provide power for durations longer than 30 days shall comply with Section 1206.10.7.
2. Mobile ESS deployments shall not exceed 180 days unless additional operational permits are obtained.

1206.10.7.2 Restricted locations. Deployed mobile ESS operations shall not be located indoors, in covered parking garages, on rooftops, below grade, or under building overhangs.

1206.10.7.3 Clearance to exposures. Deployed mobile ESS shall be separated by a minimum 10 feet (3048 mm) from the following exposures:

1. Public ways
2. Buildings
3. Stored combustible materials
4. Hazardous materials
5. High-piled stock
6. Other exposure hazards

Deployed mobile ESS shall be separated by a minimum 50 feet (15.3 M) from public seating areas and from tents, canopies and membrane structures with an occupant load of 30 or more.

1206.10.7.4 Electrical connections. Electrical connections shall be made in accordance with the manufacturer's instructions and the UL 9540 listing. Temporary wiring for electrical power connections shall comply with NFPA 70. Fixed electrical wiring shall not be provided.

1206.10.7.5 Local staging. Mobile ESS in transit from the charging and storage location to the deployment location and back shall not be parked within 100 feet (30,480 mm) of an occupied building for more than one hour during transit, unless specifically approved by the fire code official when the permit is issued.

1206.10.7.6 Fencing. An approved fence with a locked gate or other approved barrier shall be provided to keep the general public at least five feet (1024 mm) from the outer enclosure of a deployed mobile ESS.

**TABLE 1206.10
MOBILE ENERGY STORAGE SYSTEMS (ESS)**

COMPLIANCE REQUIRED	DEPLOYMENT ^a
<u>1206.4 All ESS installations</u>	Yes ^b
<u>1206.5.1 Size and separation</u>	Yes ^c
<u>1206.5.2 Maximum allowable quantities</u>	Yes
<u>1206.5.4 Smoke and automatic fire detection</u>	Yes ^e
<u>1206.5.5 Fire suppression systems</u>	Yes ^d
<u>1206.5.6 Maximum enclosure size</u>	Yes
<u>1206.5.7 Vegetation control</u>	Yes
<u>1206.5.8 Means of egress separation</u>	Yes
<u>1206.6 Technology specific protection</u>	Yes

a. See Section 1206.10.2.

b. Mobile operations on wheeled vehicle or trailers shall not be required to comply with Section 1206.4.4 seismic and structural load requirements.

c. In walk-in units, spacing is not required between ESS units and the walls of the enclosure.

d. Fire suppression system connections to the water supply shall be permitted to use approved temporary connections.

e. Alarm signals are not required to be transmitted to an approved location for mobile ESS deployed 30 days or less.

1206.10.7.7 Smoking. Smoking shall be prohibited within 10 feet (3048 mm) of mobile ESS. Signs shall be posted in accordance with Section 310.

Delete without substitution

~~**1206.1 Scope.** The provisions in this section are applicable to energy storage systems designed to provide electrical power to a building or facility. These systems are used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.~~

~~**1206.2 Stationary storage battery systems.** Stationary storage battery systems having capacities exceeding the values shown in Table 1206.2 shall comply with Section 1206.2.1 through 1206.2.12.6, as applicable.~~

**TABLE 1206.2
BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.**

BATTERY TECHNOLOGY	CAPACITY^a
Flow batteries ^b	20 kWh
Lead acid, all types	70 kWh
Lithium, all types	20 kWh
Nickel cadmium (Ni-Cd)	70 kWh
Sodium, all types	20 kWh ^c
Other battery technologies	10 kWh

For SI: 1 kilowatt-hour = 3.6 megajoules.

- 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 for sodium-ion technologies.

1206.2.1 Permits. Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with Section 105.7.2.

1206.2.2 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-resistance-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-extinguishing, smoke detection and ventilation systems;
8. Rack storage arrangement, including seismic support criteria.

1206.2.3 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 1206.2 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. Where allowed as a basis for increasing maximum allowable quantities in accordance with Section 1206.2.9.

1206.2.3.1 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-extinguishing or gas detection system;
7. Spill neutralization not being provided or failure of the secondary containment system;

1206.2.3.2 Analysis approval. The *fire code official* is authorized to approve the hazardous mitigation analysis provided that the hazard mitigation analysis demonstrates all of the following:

1. Fires or explosions will be contained within unoccupied battery storage rooms for the minimum duration of the fire-resistance-rated walls identified in Table 509.1 of the International Building Code;
2. Fires and explosions in battery cabinets in occupied work centers will be detected in time to allow occupants within the room to evacuate safely;
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in excess of Immediately Dangerous to Life or Health (IDLH) levels 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 percent 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;

1206.2.3.3 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 1206.2, shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters:

1206.2.4 Seismic and structural design. Stationary 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:

1206.2.5 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.

~~**1206.2.6 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 1206.2.8.5 shall not be stored less than 3 feet (915 mm) from battery cabinets.~~

~~**1206.2.7 Testing, maintenance and repair.** 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.~~

~~**1206.2.8 Location and construction.** Rooms and areas containing stationary storage battery systems shall be designed, located and constructed in accordance with Sections 1206.2.8.1 through 1206.2.8.7.4.~~

~~**1206.2.8.1 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.~~

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, where *approved by the fire code official*.~~

~~**1206.2.8.2 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.~~

~~**1206.2.8.3 Stationary battery arrays.** Storage batteries, prepackaged stationary storage battery systems and preengineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 kWh (180 megajoules) each. Each stationary battery array shall be spaced not less than 3 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 preengineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 250 kWh (900 megajoules) each.~~
- ~~3. The fire code official is authorized to approve listed, preengineered 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.~~

~~**1206.2.8.4 Separate rooms.** Where stationary batteries are installed in a separate equipment room that can be accessed only by authorized personnel, they shall be permitted to be installed on an open rack for ease of maintenance.~~

~~**1206.2.8.5 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.~~

~~**1206.2.8.5.1 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.~~

~~**1206.2.8.6 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. The additional markings required in Section 1206.2.12 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.

1206.2.8.6.1 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.

1206.2.8.6.2 Cabinet signage. Battery storage cabinets provided in occupied work centers in accordance with Section 1206.2.8.5 shall have exterior labels that identify the manufacturer and model number of the system and electrical rating (voltage and current) of the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical and chemical hazards, as required by Section 1206.2.12.

1206.2.8.7 Outdoor installations. Stationary storage battery systems located outdoors shall comply with Sections 1206.2.8.7 through 1206.2.8.7.4, in addition to all applicable requirements of Section 1206.2. Installations in outdoor enclosures or containers that 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 3 feet (914 mm) from the container walls.

1206.2.8.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a minimum 5 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.

1206.2.8.7.2 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 not less than 10 feet (3048 mm).

Exception: The fire code official is authorized to approve lesser 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.

1206.2.8.7.3 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.

1206.2.8.7.4 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.

1206.2.9 Maximum allowable quantities. Fire areas within buildings containing stationary storage battery systems exceeding the maximum allowable quantities in Table 1206.2.9 shall comply with all applicable Group II 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 1206.2.9 shall be treated as incidental use areas and not Group II occupancies based on a hazardous mitigation analysis in accordance with Section 1206.2.3 and large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

**TABLE 1206.2.9
MAXIMUM ALLOWABLE BATTERY QUANTITIES**

BATTERY TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES^a	GROUP H OCCUPANCY
Flow batteries ^b	600 kWh	Group H-2
Lead acid, all types	Unlimited	Not Applicable
Lithium, all types	600 kWh	Group H-2
Nickel cadmium (Ni-Cd)	Unlimited	Not Applicable
Sodium, all types	600 kWh	Group H-2
Other battery technologies	200 kWh	Group H-2 ^c

For SI: 1 kilowatt-hour = 3.6 megajoules.

- a. ~~For batteries rated in amp-hours, Kilowatt-hours (kWh) shall equal rated battery voltage times the amp-hour rating divided by 1,000.~~
- 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.~~

1206.2.9.1 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 percent, the area shall be treated as a Group H occupancy in accordance with Table 1206.2.9.~~

1206.2.10 Storage batteries and equipment. ~~The design and installation of storage batteries and related equipment shall comply with Sections 1206.2.10.1 through 1206.2.10.8.~~

1206.2.10.1 Listings. ~~Storage batteries and battery storage systems shall comply with the following:~~

1. ~~Storage batteries shall be listed in accordance with UL 1973.~~
2. ~~Prepackaged and preengineered stationary storage battery systems shall be listed in accordance with UL 9540.~~

Exception: ~~Lead-acid batteries are not required to be listed.~~

1206.2.10.2 Prepackaged and preengineered systems. ~~Prepackaged and preengineered stationary storage battery systems shall be installed in accordance with their listing and the manufacturer's instructions.~~

1206.2.10.3 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, over voltage or under voltage are detected.~~

1206.2.10.4 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 UL 1564 or provided as part of a listed preengineered or prepackaged stationary storage battery system.~~

1206.2.10.5 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.~~

1206.2.10.6 Safety caps. ~~Vented batteries shall be provided with flame-arresting safety caps.~~

1206.2.10.7 Thermal runaway. ~~Where required by Section 1206.2.12, storage batteries shall be provided with a listed device or other approved method to prevent, detect and control thermal runaway.~~

1206.2.10.8 Toxic and highly toxic gas. ~~Stationary storage battery systems that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall comply with Chapter 60.~~

1206.2.11 Fire-extinguishing and detection systems. Fire-extinguishing and detection systems shall be provided in accordance with Sections 1206.2.11.1 through 1206.2.11.5.

1206.2.11.1 Fire-extinguishing 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-extinguishing 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.

1206.2.11.1.1 Alternative fire-extinguishing 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 alternative fire-extinguishing system based on full-scale fire and fault condition testing conducted or witnessed and reported by an *approved laboratory*.

1206.2.11.2 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.

1206.2.11.3 Ventilation. Where required by Section 1206.2.3 or 1206.2.12, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the International Mechanical Code and one of the following:

1. 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.
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot $[0.00508 \text{ m}^3/(\text{s} \cdot \text{m}^2)]$ of floor area, but not less than 150 cfm (4 m^3/min).

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.

1206.2.11.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain storage batteries that are required by Section 1206.2.3 or 1206.2.12 to be provided with ventilation, the cabinet shall be provided with ventilation in accordance with Section 1206.2.11.3.

1206.2.11.3.2 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.

1206.2.11.4 Gas detection system. Where required by Section 1206.2.3 or 1206.2.12, rooms containing stationary storage battery systems shall be protected by a 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 gas exceeds one-half of the IDLH.

1206.2.11.4.1 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.

Exception: Lead-acid and nickel-cadmium stationary storage battery systems shall not be required to comply with items 1, 2 and 3.

1206.2.11.5 Spill control and neutralization. Where required by Section 1206.2.12, 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:

1. For batteries 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.
2. For batteries 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.

1206.2.12 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.

1206.2.12.1 Lead-acid storage batteries. Stationary storage battery systems utilizing lead-acid storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.
2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.
3. Thermal runaway protection shall be provided for valve-regulated lead-acid (VRLA) storage batteries in accordance with Section 1206.2.10.7.
4. The signage in Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.

1206.3.5.1 Fire-extinguishing 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 automatic sprinkler system based on full-scale fire and fault condition testing conducted by an approved laboratory.

1206.2.12.2 Nickel-cadmium (Ni-Cd) storage batteries. Stationary storage battery systems utilizing nickel-cadmium (Ni-Cd) storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.
2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.
3. Thermal runaway protection shall be provided for valve-regulated sealed nickel-cadmium storage batteries in accordance with Section 1206.2.10.7.
4. The signage in Section 1206.2.8.6 shall indicate the room contains nickel-cadmium batteries.

1206.2.12.3 Lithium-ion storage batteries. The signage in Section 1206.2.8.6 shall indicate the type of lithium batteries contained in the room.

1206.3.2.5 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.

1206.2.12.4 Sodium-beta storage batteries. Stationary storage battery systems utilizing sodium-beta storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.
2. The signage in Section 1206.2.8.6 shall indicate the type of sodium batteries in the room and include the instructions, "APPLY NO WATER."

1206.3.2.6 Outdoor installation. Capacitor energy systems located outdoors shall comply with Sections 1206.3.2.6 through 1206.3.2.6.4 in addition to all applicable requirements of Section 1206.3. Installations in outdoor enclosures or containers that 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 3 feet (914 mm) from the container walls.

1206.3.2.6.1 Separation. Capacitor energy systems located outdoors shall be not less than 5 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 lesser 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.

1206.2.12.5 Flow storage batteries. Stationary storage battery systems utilizing flow storage batteries shall comply with the following:

1. Ventilation shall be provided in accordance with Section 1206.2.11.3.
2. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.
3. The signage required in Section 1206.2.8.6 shall indicate the type of flow batteries in the room.

1206.3.2.6.3 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.

1206.3.2.1 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.

1206.3.4.4 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 UL 1564 or provided as part of a listed preengineered or prepackaged capacitor energy storage system.

1206.2.12.6 Other battery technologies. Stationary storage battery systems utilizing battery technologies other than those described in Sections 1206.2.12.1 through 1206.2.12.5 shall comply with the following:

1. Gas detection systems complying with Section 916 shall be provided in accordance with Section 1206.2.11.4 where the batteries have the potential to produce toxic or highly toxic gas 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 1206.2.11.3.
3. Spill control and neutralization shall be in accordance with Section 1206.2.11.5.
4. In addition to the signage required in Section 1206.2.8.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate that the room contains energized electrical circuits.

1206.3.2.2 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:

1. Group B, F, M, S and U occupancies by 1-hour fire-resistance-rated construction.
2. Group A, E, I and R occupancies by 2-hour fire-resistance-rated construction.

1206.3.2.6.4 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.

1206.3.4.1 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 preengineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

1206.3.4.5 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.~~

1206.3.5.1.1 Alternative fire extinguishing 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 system based on full-scale fire and fault condition testing conducted by an approved laboratory.~~

1206.3 Capacitor energy storage systems. ~~Capacitor energy storage systems having capacities exceeding 3 kWh (10.8 megajoules) shall comply with Sections 1206.3 through 1206.3.2.6.1.~~

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.~~

1206.3.2.3 Capacitor arrays. ~~Capacitor energy storage systems shall be segregated into capacitor arrays not exceeding 50 kWh (180 megajoules) each. Each array shall be spaced not less than 3 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 3 feet (914 mm) from the container walls.~~

1206.3.3 Maximum allowable quantities. ~~Fire areas within buildings containing capacitor energy storage systems that exceed 600 kWh of energy capacity shall comply with all applicable Group H occupancy requirements in this code and the International Building Code.~~

1206.3.4.2 Prepackaged and preengineered systems. ~~In addition to other applicable requirements of this code, prepackaged and preengineered capacitor energy storage systems shall be installed in accordance with their listing and the manufacturer's instructions.~~

1206.3.5.3 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 one of the following:~~

- ~~1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25 percent of the lower flammability limit.~~
- ~~2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [$0.00508 \text{ m}^3/(\text{s} \cdot \text{m}^2)$] of floor area, but not less than 150 cfm ($4 \text{ m}^3/\text{min}$).~~

~~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.~~

1206.3.5.3.1 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.~~

1206.3.1 Permits. ~~Permits shall be obtained for the installation of capacitor energy storage systems in accordance with Section 105.7.3.~~

1206.3.2.4 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 verbiage and information:~~

- ~~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.~~

1206.3.4.3 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, over voltage or under voltage are detected.~~

~~**1206.3.5.2 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.~~

~~**1206.3.5.4 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 capacitors as follows:~~

- ~~1. 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.~~
- ~~2. 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.~~

~~**1206.3.2.6.2 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 not less than 10 feet (3048 mm):~~

~~**Exception:** The *fire code official* is authorized to approve lesser 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.~~

~~**1206.3.6 Testing, maintenance and repair.** 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 capacitor 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.~~

~~**1206.3.2 Location and construction.** Rooms and areas containing capacitor energy storage systems shall be designed, located and constructed in accordance with Sections 1206.3.2 through 1206.3.2.5.~~

~~**1206.3.4 Capacitors and equipment.** The design and installation of *capacitor energy storage systems* and related equipment shall comply with Sections 1206.3.4.1 through 1206.3.4.5.~~

~~**1206.3.5 Fire-extinguishing and detection systems.** Fire-extinguishing and smoke detection systems shall be provided in *capacitor energy storage system* rooms in accordance with Sections 1206.3.5.1 through 1206.3.5.2.~~

Add new standard(s) follows

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

76 - 16.:

Standard for the Fire Protection of Telecommunications Facilities

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

1974 -17:

Evaluation for Re-purposing Batteries

9540A-17:

Standard for Safety Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

2018 International Building Code

**[F] TABLE 414.5.1
EXPLOSION CONTROL REQUIREMENTS^{a, h}**

MATERIAL	CLASS	EXPLOSION CONTROL METHODS	
		Barricade construction	Explosion (deflagration) venting or explosion (deflagration) prevention systems ^b
HAZARD CATEGORY			
Combustible dusts ^c	—	Not Required	Required
Cryogenic flammables	—	Not Required	Required
Explosives	Division 1.1	Required	Not Required
	Division 1.2	Required	Not Required
	Division 1.3	Not Required	Required
	Division 1.4	Not Required	Required
	Division 1.5	Required	Not Required
	Division 1.6	Required	Not Required
Flammable gas	Gaseous	Not Required	Required
	Liquefied	Not Required	Required
Flammable liquid	IA ^d	Not Required	Required
	IB ^e	Not Required	Required
Organic peroxides	U	Required	Not Permitted
	I	Required	Not Permitted
Oxidizer liquids and solids	4	Required	Not Permitted
Pyrophoric gas	—	Not Required	Required
Unstable (reactive)	4	Required	Not Permitted
	3 Detonable	Required	Not Permitted
	3 Nondetonable	Not Required	Required
Water-reactive liquids and solids	3	Not Required	Required
	2 ^g	Not Required	Required
SPECIAL USES			
Acetylene generator rooms	—	Not Required	Required
<u>Electrochemical energy storage systemsⁱ</u>	---	<u>Not Required</u>	<u>Required</u>
Grain processing	—	Not Required	Required
Liquefied petroleum gas-distribution facilities	—	Not Required	Required
Where explosion hazards exist ^f	Detonation	Required	Not Permitted
	Deflagration	Not Required	Required

- a. See Section 414.1.3.
- b. See the International Fire Code .
- c. As generated during manufacturing or processing.
- d. Storage or use.
- e. In open use or dispensing.
- f. Rooms containing dispensing and use of hazardous materials where an explosive environment can occur because of the characteristics or nature of the hazardous materials or as a result of the dispensing or use process.
- g. A method of explosion control shall be provided where Class 2 water-reactive materials can form potentially explosive mixtures.
- h. Explosion venting is not required for Group H-5 fabrication areas complying with Section 415.11.1 and the International Fire Code .
- i. Where explosion control is required in Section 1206.6 of the International Fire Code.

Reason: The addition of energy storage system (ESS) requirements into the 2018 code was an initial effort to address

safety hazards associated with the increased use of lithium-ion batteries, capacitors and other modern energy storage system (ESS) technologies for an expanded number of grid related energy storage applications. The new requirements were a huge step toward addressing modern ESS technologies and grid based applications. However as written the requirements made it difficult to apply appropriate safety requirements for different installations, each with their own risks and exposures. Case in point, a lead acid battery ESS installation in an unmanned rural telecommunications repeater doesn't present the same risks and exposures as a lithium-ion battery ESS installation in a mixed occupancy high rise in an urban area.

Since the 2018 ESS requirements were developed there has been a lot of work done by private and government stakeholders to enhance ESS installation requirements, including the initial drafting of the NFPA 855 Energy Storage System standard. The Fire Code Action Committee's ESS work group, which includes 45+ code officials, manufacturers, users and industry experts identified several areas in the 2018 code that needed to be addressed to provide requirements that better address the hazards and exposures associated with various types of ESS installations, technologies and operations.

This section rewrite retains many of the basic protection concepts in the 2018 code, but also provide customized requirements for different types of installations and different types of ESS technologies in use today. We chose to replace the section in its entirety, rather than trying to edit existing text. Explanations of some of the more significant changes are included below.

Mobile ESS operations, consisting of lithium-ion batteries on trailers or skids are being deployed to locations to provide a temporary source of power. An operational permit is required for the mobile operations.

Section 1206.1 includes general requirements for all ESS. No significant changes were made to the Construction Document and Hazard Mitigation Analysis requirements.

Section 1206.1.5 - The 2018 code allowed certain variances be allowed based on large scale fire and fault condition testing, but the criteria for conducting such testing was undefined. The UL 9540A Test Method was specifically developed to cover this testing.

Section 1206.1.6 - This section was developed to address fire events involving lithium-ion battery systems, since lithium-ion battery fires have the potential to re-ignite hours or even days after initial extinguishment by the fire department, who cannot remain on scene indefinitely until the fire damaged ESS is safely removed from the premises. The fire remediation requirements, similar to fire watch requirements, make the owner responsible for sending mitigation personnel to the scene take over the remediation process.

Section 1206.2 covers commissioning, decommissioning, maintenance and testing requirements, which are important considerations for providing a safe, code compliant installation.

Section 1206.3 covers the ESS equipment itself, and much of these requirements are unchanged from the 2018 code. New section on repairs, retrofits and replacements were added to address practices to be followed when systems need to be upgraded or serviced.

Section 1206.3.8 allows code officials to regulate installations of repurposed electric vehicle batteries that are converted for ESS use in buildings.

Section 1206.4 includes requirements that need to be met by all ESS installations, and much of these are unchanged from the 2018 requirements. The Walk-in units section, with associated definition, is new and recognizes that ISO type shipping containers are being used to house ESS in various outdoor and mobile applications.

Section 1206.5 describes ESS protection requirements that are only applicable for certain type of installations, such as indoor dedicated use ESS installations, outdoor ESS installations in remote locations, and rooftop installations. Section 1206.5 tells you how to provide a particular type of protection, and tables in Sections 1206.7 through 1206.10 tell you when this protection is required.

1206.5.2 The size and separation protection concept (formerly "arrays") was introduced in the 2018 code. The term array was confusing and has been replaced. A maximum ESS unit size of 50 KWh previously only applied to unlisted ESS, but now all ESS are required to be listed due to the significant fire event that can be produced by 50 KWh of some ESS technologies.

1206.5.3 MAQs amounts are essentially the same as 2018 values. Due to introductions of facilities such as dedicated use ESS (utility size) requirements, and exemptions for increases based on large scale fire testing, it is no longer necessary to reference Group H-2 occupancies.

1206.5.4 Elevation requirements are similar to those in the 2018 IFC, but now restrict below grade installations except in underground vaults or when specifically approved by the code official. This is due to concerns raised by the fire service about responding to ESS fires in below grade locations.

1206.5.5 The previous smoke detection requirements have been modified to allow radiant energy-sensing fire detection as an option.

1206.5.6 The fire suppression requirements in the 2018 code only allowed NFPA 13 systems to be provided to protect ESS, but it was difficult or impossible to determine required design density. These requirements have been updated to specify a minimum 0.3 gpm/ft.² design density, with options for lower densities based on large scale fire testing per UL 9540A. Also an option for providing alternate fire suppression systems has been added, provided they have successfully passed UL 9540A fire testing.

1206.5.7 A maximum enclosure size for walk-in units, corresponding to the largest ISO type containers used for these installations, was established to provide differentiation between a walk-in unit and an inside installation.

1206.5.9 Separation from outdoor means of egress pathways leading to a public way were in the 2018 code.

Section 1206.6 includes electrochemical ESS technology specific protection, in a new table format. Table 1206.6 identifies which technologies need technology specific protection, which may include exhaust ventilation, spill control and neutralization, explosion control, safety caps and thermal runaway.

Section 1206.6.4 (explosion control) addresses a potentially significant hazard. Lithium-ion battery systems and other electrochemical ESS technologies have the potential to rapidly build up potentially explosive atmospheres in the battery or electrochemical ESS room or enclosure under thermal runaway and other conditions which could result in a catastrophic fire and or explosion. To protect against these hazards explosion control in accordance with IFC Section 911 is required for certain battery technologies.

Section 1206.7 covers indoor locations, and identifies two types of indoor installations, dedicated use installations (typical of utility grid related facilities) and non-dedicated use installations (typical of ESS in mixed use buildings or incidental use areas of occupancies). Protection for each installation is commensurate with the related risk and exposures.

Similarly Section 1206.8 covers two types of outdoor installations, remote outdoor installations (more than 100 feet from exposures, and installations near exposures (<100 ft.) more typical of an urban environment.

Section 1206.9 covers two special installations, rooftop ESS and open parking garage ESS.

Section 1206.10 covers two types of mobile ESS installations/operations, charging and storage of the mobile ESS at its home facility when it is not deployed to an event or facility, and deployment of the mobile ESS for temporary energy storage applications, such as providing power at an electric vehicle event. Mobile ESS charging and storage locations are treated the same as a stationary indoor or outdoor installation in accordance with Section 1206.7 or 1206.8, but can include temporary electrical and fire suppression system connections. This provides an acceptable level of protection based on the exposures at the facility, and prevents parties from using an ESS on wheels as a permanent ESS with less than effective protection.

Section 1206.10 also includes requirements for deploying mobile ESS to a facility or event for providing up to 30 days of temporary power (with some exceptions). An operational permit is required for each mobile ESS deployment.

The proposal also eliminated references to providing ESS in incidental use areas. Modern load leveling and peak shaving ESS applications make the 10% floor area limitations of incidental use areas impractical for anticipated installations. However the additional protection in this section, including equivalent Section 1206.7.5 fire-resistance rated separations, should effectively mitigate hazards with providing ESS on floor areas greater than 10% of the total floor area.

To summarize this proposal, developed by a large industry and code official work group, more effectively protects ESS installations based on knowledge gained since last code cycle. It provides protection customized for the types of installations that are being deployed today, instead of using the "one size fits all" type of protection in the 2018 code.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Some of the requirements in this proposal have the potential to increase the cost of providing ESS installations. However some of the provisions in this proposal better address risks and owner/user needs in dedicated use (utility) buildings and outdoor remote installations, and will probably decrease the cost of those installations as compared to installations installed using the 2018 IFC requirements.

Analysis: A review of the standards proposed for inclusion in the code, UL 1974 -17, UL 9540A-17 and NFPA 76-16, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 105.6.14 Energy storage systems, mobile. An operational permit is required for stationary and mobile energy storage systems regulated by Section 1206.

1201.3 Mixed system installation. Where approved, the aggregate nameplate kWh energy of all energy storage systems in a fire area shall not exceed the maximum quantity specified for any of the energy systems in this chapter. Where required by the fire code official, a hazard mitigation analysis shall be provided and approved in accordance with Section 104.7.2 to evaluate any potential adverse interaction between the various energy systems and technologies.

1206.1 General. The provisions in this section are applicable to stationary and mobile electrical energy storage systems (ESS).

Exception: ESS in Group R-3 and R-4 occupancies shall comply with Section 1206.11.

1206.1.2 Permits. Permits shall be obtained for ESS as follows:

1. Construction permits shall be obtained for stationary ESS installations and for mobile ESS charging and storage installations covered by 1206.10.1. Permits shall be obtained in accordance with Sections 105.7.7.

2. Operational permits shall be obtained for stationary ESS installations and for mobile ESS deployment operations covered by Section 1206.10.3. Permits shall be obtained in accordance with Sections 105.6.14.

1206.1.2.1 Communication utilities. Operational permits shall not be required for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

TABLE 1206.7

INDOOR ESS INSTALLATIONS

1206.5.4 Smoke and automatic fire detection ^{c, f}

NA = Not allowed.

a. See Section 1206.7.1.

b. See Section 1206.7.2.

c. Where approved by the fire code official, alarm signals are not required to be transmitted to a central station, proprietary or remote station service in accordance with NFPA 72, or a constantly attended location where local fire alarm annunciation is provided and trained personnel are always present.

d. Where approved by the fire code official, fire suppression systems are permitted to be omitted in dedicated use buildings located more than 100 feet (30.5 M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

f. Lead-acid and nickel cadmium battery systems installed in Group U buildings and structures less than 1500 ft² (140 m²) under the exclusive control of communications utilities, and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76 are not required to have an approved automatic smoke or fire detection system.

1206.8 Outdoor installations. Outdoor installations shall be in accordance with Sections 1206.8.1 through 1206.8.3. Exterior wall installations for individual ESS units not exceeding 20 kWh shall be in accordance with Section 1206.8.4.

1206.8.4 Exterior wall installations. ESS shall be permitted to be installed outdoors on exterior walls of buildings when all of the following conditions are met:

1. The maximum energy capacity of individual ESS units shall not exceed 20 kWh.

2. The ESS shall comply with applicable requirements in Section 1206.

3. The ESS shall be installed in accordance with the manufacturer's instructions and their listing.

4. Individual ESS units shall be separated from each other by at least three feet (914 mm).

5. The ESS shall be separated from doors, windows, operable openings into buildings, or HVAC inlets by at least five feet (1524 mm).

Exception: Where approved smaller separation distances in items 4 and 5 shall be permitted based on large scale fire testing complying with Section 1206.1.5.

1206.11 ESS in Group R-3 and R-4 Occupancies. ESS in Group R-3 and R-4 occupancies shall be installed and maintained in accordance with Sections 1206.11.1 through 1206.11.9. The temporary use of an owner or occupant's electric powered vehicle as an ESS shall be in accordance with Section 1206.4.10.

1206.11.1 Equipment listings. ESS shall be listed and labeled for residential use in accordance with UL 9540.

Exceptions:

1. Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.

2. ESS less than 1 kWh (3.6 megajoules).

1206.11.2 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing.

1206.11.2.1 Spacing. Individual units shall be separated from each other by at least three feet of spacing unless smaller separation distances are documented to be adequate based on large scale fire testing complying with Section 1206.1.5.

1206.11.3 Location. ESS shall only be installed in the following locations:

1. Detached garages and detached accessory structures.

2. Attached garages separated from the dwelling unit living space and sleeping units in accordance with Section 406.3.2 of the International Building Code.

3. Outdoors on exterior walls located a minimum 3 ft. from doors and windows.

4. Utility closets and storage or utility spaces within dwelling units and sleeping units.

1206.11.4 Energy ratings. Individual ESS units shall have a maximum rating of 20 kWh. The aggregate rating structure shall not exceed:

1. 40 kWh within utility closets and storage or utility spaces.

2. 80 kWh in attached or detached garages and detached accessory structures.

3. 80 kWh on exterior walls.

4. 80 kWh outdoors on the ground.

1206.11.5 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be listed and labeled in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

1206.11.6 Fire detection. Rooms and areas within dwellings units, sleeping units and attached garages in which ESS are installed shall be protected by smoke alarms in accordance with Section 907.2.10. A heat detector listed and interconnected to the smoke alarms shall be installed in locations within dwelling units, sleeping units and attached garages where smoke alarms cannot be installed based on their listing.

1206.11.7 Protection from impact. Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers. Appliances in garages shall also be installed in accordance with Section 304.3 of the International Mechanical Code.

1206.11.8 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with Section 1206.6.1.

1206.11.9 Toxic and highly toxic gas. ESS that have the potential to release toxic or highly toxic gas during charging, discharging and normal use conditions shall not be installed within Group R-3 or R-4 occupancies.

1206.11.10 Electric vehicle use. The temporary use of an owner or occupant's electric powered vehicle to power a dwelling unit or sleeping unit while parked in an attached or detached garage or outside shall comply with the vehicle manufacturer's instructions and NFPA 70.

Committee Reason: The proposal was approved as the provisions of the 2018 Section 1206 need refinement and does not offer the flexibility and understanding of the different types of installations in use such as standalone systems or systems within a high rise building. There are a series of modification that work to integrate concepts from other proposals within code change proposal F203-18.

- **Section 1201.3.** - The modification to Section 1201.3 of the 2018 IFC pulls all energy systems together to better determine what can be included in a fire area and appropriately requires the nameplate kWh to determine the size of the systems. This concept is found in code change proposal F190-18.
- **Sections 1206.1.2, 1206.1.2.1.** Section 1206.1.2 of the proposal was revised along with the addition of a new section 1206.1.2.1 allowing the exception from operational permits for the telecommunications utilities. As part of this revision the permit requirements proposed in 105.6.14 were broadened to both mobile and stationary ESS. This is consistent with F204-18 which was written with the intent to be integrated with the revised provisions in Section 1206. This is also appropriate since the telecommunication industry must comply with NFPA 76.
- **Table 1206.7.** This table was modified to include a footnote providing an exception for lead acid and nickel cadmium installations for the communication utilities from smoke and automatic fire detection due to the good safety history and nature of the installations. This modification originates in F208-18 and due to the nature of the revisions to Section 1206 was better addressed in the new format of F203-18.
- **Section 1206.8.4.** The addition of Section 1206.8.4 and associated revisions to proposed Section 1206.8 recognize wall mounted ESS. These provisions were originally proposed in F210-18 and were intended to be integrated into the rewrite of Section 1206.
- **Section 1206.11.** The addition of Section 1206.11 recognizes the use of ESS in a residential setting and provides appropriate requirements for the fire code official. These provisions were originally proposed in code change proposal F211-18 and were intended to be integrated into the rewrite of Section 1206. Note that as part of this modification Section 1206.1 was revised to add a new exception for Group R-3 and R-4 occupancies that comply with new section 1206.11. (Vote: 12-1)

Assembly Action:

None

F203-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1201.1 Scope. The provisions of this chapter shall apply to the installation, operation, maintenance, repair, retrofitting, testing, commissioning and decommissioning of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency, provided that the ESS under the exclusive control of such electric utility or lawfully designated agent provides an equivalent level of safety as required by Section 1206.

Commenter's Reason: The intent of the proposed change is to ensure that all ESS systems enjoy the same level of safety, irrespective of the base code governing its installation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No cost impact as the proposal simply clarifies the existing scope without adding or subtracting from it.

Public Comment 2:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50-250 kWh (~~180-900~~ Mega joules). Each group shall be separated a minimum three feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. The fire code official is authorized to approve larger capacities or smaller separation distances based on large scale fire testing complying with Section 1206.1.5.

Commenter's Reason: The reduction from 250 to 50 kWh is burdensome to the industry. ESA appreciates the concern for safety but it is unaware of any actual fire that was either initiated or made worse by virtue of the fact that a 250 kWh group was installed vs a 50 kWh group.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. A limitation of 50 kWhs will increase the cost of construction by reducing the amount of ESS that can be installed per sq ft.

Public Comment 3:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

**TABLE 1206.5
MAXIMUM ALLOWABLE QUANTITIES OF ELECTROCHEMICAL ESS**

TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES ^a
STORAGE BATTERIES	
Lead acid, all types	Unlimited
Nickel cadmium (Ni-Cd)	Unlimited
Nickel metal hydride (Ni-MH)	Unlimited
Lithium-ion	600 kWh <u>1,000 kWh</u>
Flow batteries ^b	600 kWh
Other battery technologies	200 kWh
CAPACITORS	
All types	20 kWh
OTHER ELECTROCHEMICAL ESS	
All types	20 kWh

a. For electrochemical ESS units rated in Amp-Hours, kWh shall equal rated voltage times the Amp-hour rating divided by 1000

b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies

Commenter's Reason: Based on industry experience, ESA does not believe the risk of fire increases significantly by allowing the aggregation of 1,000 kWh groups of batteries vis-à-vis 600 kWh groups.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. Allowing the aggregation of 1,000 kWh groupings would make the cost of ESS more economical.

Public Comment 4:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.8.1 Remote outdoor installations. For the purpose of Table 1206.8, remote outdoor installations include ESS located more than ~~100-50~~ feet (~~30-15.5-25~~ M) from buildings, lot lines, public ways, stored combustible materials, hazardous materials, high piled stock and other exposure hazards.

Commenter's Reason: ESA members have growing experience with ESS systems and they are unconvinced of any additional safety benefit that would accrue by locating an ESS container 100 ft from exposures rather than 50 ft although the additional expense is significant.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction Doubling the distance from 50 to 100 ft erodes the cost effectiveness of ESS.

Public Comment 5:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

ENERGY STORAGE SYSTEM, MOBILE.

~~An energy storage system capable of being moved and utilized for temporary energy storage applications, and not installed as fixed or stationary electrical equipment. The system can include integral wheels for transportation, or be loaded on a trailer and unloaded for charging, storage and deployment.~~deployed in a deployable enclosure or mounted on a rail car, wheeled trailer, semi-trailer, vehicle or hand-cart, used for microgrid, grid-interactive usage, or other uses such as portable telecommunication facilities. Deployments are considered temporary where used for durations of less than 30 days.

Commenter's Reason: adds clarity for mobile ESS

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

No cost impact as it adds no new requirements and is simply a clarification of intent.

Public Comment 6:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.6.1 Exhaust-ventilationVentilation. Where required by Table 1206.6 or elsewhere in this code, ~~exhaust~~ ventilation of rooms, areas, and walk-in units containing electrochemical ESS shall be provided in accordance with the International Mechanical Code and Section 1206.6.1.1 or 1206.6.1.2.

Commenter's Reason: An HVAC unit on a container acts as both a ventilation system, as well as an exhaust system. Separating the functions of ventilation needed during normal use, and exhaust needed during emergency events is not practical in such cases - it's one and the same system.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Editorial only - adds no new requirements

Public Comment 7:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

~~**1206.5.7 Vegetation control.** Areas within 10 feet (3 m) on each side of outdoor ESS shall be cleared of combustible vegetation and other combustible growth. Single specimens of trees, shrubbery, or cultivated ground cover such as green grass, ivy, succulents, or similar plants used as ground covers shall be permitted to be exempt provided that they do not form a means of readily transmitting fire.~~

Commenter's Reason: Walk-in units are constructed of non-combustible materials. This provision seems to be a reach - is it directing the operator to cut the grass around the walk-in unit? as it is currently worded with the allowance of single species trees, etc., it is not clear what is being required.

This provision seems like good practice but would be difficult to enforce.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no impact - grass should be cut anyway -

Public Comment 8:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

ENERGY STORAGE SYSTEM (ESS). One or more devices, assembled together, not used to propel rail or wheeled vehicles, capable of storing energy in order to supply electrical energy at a future time.

Commenter's Reason: This proposal clarifies that the standard is not intended to apply to ESS used for transportation.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal only clarifies the intent. It adds no new requirements and thus does not affect cost.

Public Comment 9:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.5.6 Maximum enclosure size. Outdoor walk-in units housing ESS shall not exceed 53 feet by 8 feet by 9.5 feet high. ~~Walk-in units that exceed these dimensions, not including bolt-on HVAC and related equipment, as approved.~~ Outdoor walk-in units exceeding these limitations shall be considered indoor installations and comply with the requirements in Section 1206.7.

Commenter's Reason: The walk-in enclosure size requirement in this provision was a good faith effort to bound the maximum size but was not based on specific fire safety concerns. Some ESA containers currently in production slightly exceed the maximum size allowed. This proposal would provide flexibility.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. Increased flexibility will make ESS installations more economic.

Public Comment 10:

Proponent: Charles Foster, representing Energy Storage Association (cfoster20187@yahoo.com) requests As Modified

by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.9.3 Clearance to exposures. ESS located on rooftops and in open parking garages shall be separated by a minimum ten feet (3048 mm) from the following exposures:

1. Buildings, except the building on which rooftop ESS is mounted
2. Any portion of the building on which a rooftop system is mounted that is elevated above the rooftop on which the system is installed
3. Lot lines
4. Public ways
5. Stored combustible materials
- ~~6. Locations where motor vehicles can be parked~~
7. Hazardous materials
8. Other exposure hazards

Exceptions:

1. Clearances are permitted to be reduced to 3 feet (914 mm) where a 1-hour free standing fire barrier, suitable for exterior use, and extending 5 feet (1.5 m) above and extending 5 feet (1.5 m) beyond the physical boundary of the ESS installation is provided to protect the exposure.
2. Clearances are permitted to be reduced to 3 feet (914.4 mm) where a weatherproof enclosure constructed of noncombustible materials is provided over the ESS and it has been demonstrated that a fire within the enclosure will not ignite combustible materials outside the enclosure based on large scale fire testing complying with Section 1206.1.5.

Commenter's Reason: 10 ft is unwarranted. NFPA 13 Handbook states: Even though there is gasoline in the automobiles, the loss history for these occupancies demonstrates that the fires in standard-type garages are typically limited to one car and do not pose an excessive challenge for the sprinkler system to control. Section 4.4.4.5 of NFPA 13 only requires 5 ft separation (through means of a fence) from parked vehicles).

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. This proposal would facilitate ESS installations, driving down cost without increasing risks,

Public Comment 11:

Proponent: Richard Kluge, representing Alliance for Telecommunications Industry Solutions (richard.kluge@ericsson.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

**TABLE 1206.6
ELECTROCHEMICAL ESS TECHNOLOGY SPECIFIC REQUIREMENTS**

COMPLIANCE REQUIRED ^b	BATTERY TECHNOLOGY				OTHER ESS AND BATTERY TECHNOLOGIES ^b	CAPACITOR ESS ^b
	Lead-acid	Ni-Cad and Ni-MH	Lithium-ion	Flow		
1206.6.1 Exhaust ventilation	Yes	Yes	No	Yes	Yes	Yes
1206.6.2 Spill control and neutralization	Yes ^c	Yes ^c	No	Yes	Yes	Yes
1206.6.3Explosion control	Yes ^a	Yes ^a	Yes	No	Yes	Yes
1206.6.4 Safety caps	Yes	Yes	No	No	Yes	Yes
1206.6.5 Thermal runaway	Yes ^d	Yes	Yes de	No	Yes de	Yes

a. Not required for lead-acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.7.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented (i.e. flooded) type nickel cadmium and lead acid batteries.

d. Not required for vented (i.e. flooded) type lead acid batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

Commenter's Reason: Thermal runaway protection is not necessary for flooded lead-acid batteries. This has been consistent in the codes for many cycles, both in the IFC and NFPA 1. The public input to section 1206 made considerable changes and lost this important distinction when developing the table. Adding the footnote will make the table technically correct and reflective of the true risks of each battery chemistry.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The change will clarify that certain battery constructions are not prone to thermal runaway and do not need external thermal runaway controls.

Public Comment 12:

Proponent: Richard Kluge, representing Alliance for Telecommunications Industry Solutions (richard.kluge@ericsson.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.2 Commissioning, decommissioning, operation and maintenance. Commissioning, decommissioning, operation and maintenance shall be conducted in accordance with this section.

Exception: This section shall not apply to lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. However a decommissioning plan shall be provided and maintained where required by the fire code official.

1206.2.1 Commissioning. Commissioning of newly installed ESS, and existing ESS that have been retrofitted, replaced or previously decommissioned and are returning to service shall be conducted prior to the ESS being placed in service in accordance with a commissioning plan that has been approved prior to initiating commissioning. The commissioning plan shall include the following:

1. A narrative description of the activities that will be accomplished during each phase of commissioning including the personnel intended to accomplish each of the activities.
2. A listing of the specific ESS and associated components, controls and safety related devices to be tested, a description of the tests to be performed and the functions to be tested.
3. Conditions under which all testing will be performed, which are representative of the conditions during normal operation of the system.
4. Documentation of the owner's project requirements and the basis of design necessary to understand the installation and operation of the ESS.
5. Verification that required equipment and systems are installed in accordance with the approved plans and specifications.
6. Integrated testing for all fire and safety systems.
7. Testing for any required thermal management, ventilation or exhaust systems associated with the ESS installation.
8. Preparation and delivery of operation and maintenance documentation.
9. Training of facility operating and maintenance staff.
10. Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the operation phase.
11. Identification and documentation of personnel who are qualified to service, maintain and decommission the ESS, and respond to incidents involving the ESS, including documentation that such service has been contracted for.
12. A decommissioning plan for removing the ESS from service, and from the facility in which it is located. The plan shall include details on providing a safe, orderly shutdown of energy storage and safety systems with notification to the code officials prior to the actual decommissioning of the system. The decommissioning plan shall include contingencies for removing an intact operational ESS from service, and for removing an ESS from service that has been damaged by a fire or other event.

~~**Exception:** Commissioning shall not be required for lead acid and nickel cadmium battery systems at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC. However a decommissioning plan shall be provided and maintained where when required by the fire code official.~~

Commenter's Reason: The exception language for telecommunications installations of lead-acid or nickel-cadmium batteries complying with NFPA 76 is relocated from Section 1206.2 to 1206.2.1 Since the exception addresses both commissioning and decommissioning, this is a better location. Since telecommunications installations with lead-acid or nickel-cadmium batteries complying with NFPA 76 are exempt from commissioning process and most decommissioning processes via the code, there is no reason to require compliance to the operation and maintenance aspects. These installations have been in wide use for many decades and have had an exceptional safety record without the additional code governance.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
Relocated text will not affect cost of construction.

Public Comment 13:

Proponent: Richard Kluge, representing Alliance for Telecommunications Industry Solutions (richard.kluge@ericsson.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

**TABLE 1206.6
ELECTROCHEMICAL ESS TECHNOLOGY SPECIFIC REQUIREMENTS**

COMPLIANCE REQUIRED ^b	BATTERY TECHNOLOGY				OTHER ESS AND BATTERY TECHNOLOGIES ^b	CAPACITOR ESS ^b
	Lead-acid	Ni-Cad and Ni-MH	Lithium-ion	Flow		
1206.6.1 Exhaust ventilation	Yes	Yes	No	Yes	Yes	Yes
1206.6.2 Spill control and neutralization	Yes ^c	Yes ^c	No	Yes	Yes	Yes
1206.6.3Explosion control	Yes ^a	Yes ^a	Yes	No	Yes	Yes
1206.6.4 Safety caps	Yes	Yes	No	No	Yes	Yes
1206.6.5 Thermal runaway	Yes	Yes ^d	Yes de	No	Yes de	Yes

a. Not required for lead-acid and nickel cadmium batteries at facilities under the exclusive control of communications utilities that comply with NFPA 76 and operate at less than 50 VAC and 60 VDC.

b. Protection shall be provided unless documentation acceptable to the fire code official is provided in accordance with Section 104.7.2 that provides justification why the protection is not necessary based on the technology used.

c. Applicable to vented (i.e. flooded) type nickel cadmium and lead acid batteries.

d. Not required for vented (i.e. flooded) type nickel cadmium batteries.

e. The thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973.

Commenter's Reason: Thermal runaway protection is not necessary for flooded nickel-cadmium batteries. This has been consistent in the codes for many cycles, both in the IFC and NFPA 1. The public input to section 1206 made considerable changes and lost this important distinction when developing the table. Adding the footnote will make the table technically correct and reflective of the true risks of each battery chemistry.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
The change will not impact the cost of construction.

Public Comment 14:

Proponent: Steven Rosenstock, representing Edison Electric Institute (srosenstock@eei.org)requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

1206.11.10 Electric vehicle use. The temporary use of an owner or occupant's electric ~~powered vehicle to vehicle to~~ power a dwelling unit or sleeping unit while parked in an attached or detached garage or outside shall comply with ~~the vehicle manufacturer's instructions and~~ NFPA 70.

Commenter's Reason: This proposal makes editorial changes to Section 1206.11.10 regarding electric vehicle use. It will not be possible for a code official to know which electric vehicle will be parked at the building, so it will be impossible to enforce language on complying with vehicle manufacturer instructions (there are over 50 models of EVs available on the market today).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
As a proposal for a table and a section that is editorial in nature, this will have no impact on construction costs.

Public Comment 15:

Proponent: Philip Undercuffler, representing OutBack Power Technologies (pundercuffler@outbackpower.com)requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.3.7 Retrofits. Retrofitting of an existing ESS shall comply with the following:

1. A construction permit shall be obtained in accordance with Section 105.7.7.
2. New batteries, battery modules, capacitors and similar ESS components shall be listed ~~in accordance with UL 1973.~~
3. Battery management and other monitoring systems shall be connected and installed in accordance with the manufacturer s instructions.
4. The overall installation shall continue to comply with UL 9540 listing requirements, where applicable.
5. Systems that have been retrofitted shall be commissioned in accordance with Section 1206.2.1.
6. Retrofits shall be documented in the service records log.

Commenter's Reason: UL 1973 does not cover all ESS components, nor are all batteries listed to UL 1973; UL 1989 is the relevant standard for VRLA batteries, while flow batteries and other ESS technologies are evaluated to other standards. Any language that would allow only UL 1973 as the only option for retrofit would be too restrictive and eliminate any lead acid battery retrofit, without technical justification or benefit. The key requirement should be that any retrofit of an ESS unit must be with listed product.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposed revision would clarify that any retrofit must use listed equipment, but allows the NRTLs and the evaluation process to determine the appropriate standard for each specific piece of equipment. Not all ESS components are within the scope of UL 1973 (although without this modification, forcing equipment to be listed to inappropriate standards would increase the cost)

Public Comment 16:

Proponent: Philip Undercuffler, representing OutBack Power Technologies (pundercuffler@outbackpower.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.5.1 Size and separation. Electrochemical ESS shall be segregated into groups not exceeding 50 KWh (180 Mega joules). Each group shall be separated a minimum three feet (914 mm) from other groups and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium battery systems in facilities under the exclusive control of communications utilities and operating at less than 50 VAC and 60 VDC in accordance with NFPA 76.
2. The fire code official is authorized to approve larger capacities or smaller separation distances based on large scale fire testing complying with Section 1206.1.5.
3. Separation for lead acid battery systems shall not be required where the battery cells have flame retardant casings.

Commenter's Reason: There is no special hazard or risk requiring three foot minimum separation between groups or to walls with lead acid batteries, as was recognized both in Table 1206.5 and with the 2018 and prior versions of the IFC. Table 1206.5 allows an unlimited maximum allowable quantity for lead acid batteries regardless of voltage or application, as the table correctly recognizes that this technology does not present a special fire risk or hazard that has not already been addressed. This recognition is based on a long successful history of safe and reliable operation of hundreds of thousands of systems in a wide range of applications across the US and the world. Lead acid batteries may have their issues, which have been addressed elsewhere within this Code, but they do not have a history of propagating flame from cell to cell or otherwise presenting any hazard that needs mitigation through maintaining special clearances. The proposed requirement for flame retardant casings as a qualification for this exception provides additional assurance to address any unforeseen concerns.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposed revision would maintain similar spacing and separation requirements for lead acid batteries as exists in the 2018 IFC. Without this proposed change, construction costs for lead acid battery systems would increase substantially.

Public Comment 17:

Proponent: Philip Undercuffler, representing OutBack Power Technologies (pundercuffler@outbackpower.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

1206.11.1 Equipment listings. ESS shall be listed and labeled ~~for residential use~~ in accordance with UL 9540. ESS listed and labeled solely for utility or commercial use shall not be used for residential applications.

Exceptions:

1. Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached dedicated cabinets located not less than 5 feet (1524 mm) from exterior walls, property lines and public ways.
2. ESS less than 1 kWh (3.6 megajoules).

Commenter's Reason: Per UL 9540 40.4, energy storage systems are only marked "for residential use" when they are limited to installations only in those locations, in other words it is a restrictive marking. Some UL 9540 listed energy storage systems may have no such restrictions, and can safely be used in any application – residential, commercial, or other. Their use within the capabilities of their certification should not be artificially limited. The proposed modification would achieve the intended result, which is that products whose listing evaluation has determined that they are restricted to specific applications which are not residential may not be used in residential applications.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposed revision will not change the listing requirements for ESS -- all ESS must be listed to UL9540. It simply addresses a misunderstanding in the use of the listing mark as applies to products listed for limited applications, if a product is not marked with qualifiers it can be used in the broadest range of applications.

Public Comment 18:

Proponent: Nicholas Frank, Nexceris, representing Nexceris (n.frank@nexceris.com) requests As Submitted.

Commenter's Reason: Within IFC 1206 in section 1206.2.10.1 there is a requirement that a battery system is UL 9540 listed. However, there is no mention of UL 9540A which is a test method that provides valuable test data on the failure mechanisms of a given lithium-ion energy storage system (ESS). This is key information for authorities having jurisdiction (AHJ) when permitting lithium-ion systems. It helps them understand the associated hazards of the systems and the magnitude of failure. This is especially important given the current state of the industry where there is a large range in quality of lithium-ion cells and systems. Some systems are great at dealing with failures and others not designed to deal with failures at all. This information should be readily available during permitting.

It should be mentioned that NFPA 855 requires the UL 9540A test method and incorporating this into IFC 1206 would increase the harmonization of the energy storage system installation standards used in industry.

UL 9540A requires that a battery is overheated until failure at 5°C/minute. During heating, two distinct points of measurement are required at the off-gas event (cell venting) and thermal runaway in Section 6.2.5 and Section 6.2.6, respectively. When the UL 9540A report shows that the off-gas event occurs before thermal runaway, IFC 1206 should require off-gas monitoring. This increases the safety of the lithium-ion battery system by providing a redundant perspective on battery health, an early warning of failure, and the option to provide preventative action of thermal runaway. World class standards organizations have validated these concepts. For the IFC to miss this opportunity would be a disservice to first responders.

To summarize the intent of this public comment, it is to recognize UL 9540A in IFC 1206 as a test method for evaluating the failure mechanisms of lithium-ion battery systems. In addition to recognizing UL 9540A, the IFC to should require off-gas monitoring if the UL 9540A test report states that off-gas events occur prior to thermal runaway.

Bibliography: UL 9540A Test Method: <https://industries.ul.com/energy/battery-and-energy-storage-technology/ul-9540a-test-method>

Published paper on Off-gas Monitoring: Hill, Davion; Gully, Benjamin; Agarwal, Arun; Nourai, Ali; Thrun, Lora; Swartz, Scott; Koslowski, Mark; Cummings, Steve; Butkowski, John; Moore, Brad. (2013). Detection of off gassing from Li-ion batteries. 1-7. 10.1109/EnergyTech.2013.6645307.

Stages of a battery failure explanation: <https://liiontamer.com/lithium-ion-battery-failure-stages/>

Prevention of thermal runaway: <https://www.youtube.com/watch?v=Cx03a8GvrXA>

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction UL 9540A is a test method which will need to be performed by an external laboratory.

Off-gas monitoring adds less than 1% of the total system cost.

Public Comment 19:

Proponent: CP28 Administration.

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard UL 1974 -17:Evaluation for Re-purposing Batteries, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing

F203-18

F209-18

IFC: 1206.2.11.5

Proposed Change as Submitted

Proponent: Jeffrey Betz, AT&T Corporation, representing AT&T Corporation (jbetz@att.com)

2018 International Fire Code

Revise as follows

1206.2.11.5 Spill control and neutralization. Where required by Section 1206.2.12, 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:

1. For batteries with free-flowing electrolyte, ~~the a~~ method and materials shall be capable of neutralizing of:
 - 1.1. Providing spill control to prevent the flow of electrolyte to adjoining areas when rooms or areas are used for the storage of free-flowing electrolyte in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L)
 - 1.2. Neutralizing a spill of the total capacity from the largest individual cell or block to a pH between 5.0 and 9.0.
2. For batteries 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.

Reason: This proposal incorporates and clarifies the code industry's basic quantity requirements for spill control. It further provides the specific requirements of this chapter (12 formerly Section 608) related to vessel and aggregate thresholds currently addressed in the 2015 IFC Section 608 Commentary (2018 IFC 1206.2.11.5 Spill containment and neutralization) and 2015 IFC Code and Commentary Chapter 50 Hazardous Materials Section 5004.2.1 Spill control for hazardous materials liquids.

2015 IFC Commentary - Section 608.5

Batteries that contain a free-flowing liquid electrolyte pose the same containment problems as any other corrosive liquid hazardous material, but the containment and neutralization provisions in this section are performance based and neither specifically require spill control in the form of containment nor a specific method of neutralization. The quantity of neutralization material required to be available would be greater for these less-viscous electrolytes, however, because of their mobility and the rapidity with which they can spread and the potential scope of the spread. See the commentary to Section 5004.2.1 for further discussion of spill control strategies. The exception recognizes the reduced spill control hazard of sealed batteries that contain a higher-viscosity electrolyte.

2015 IFC Commentary - Chapter 50 Hazardous Materials 5004.2.1 Spill control for hazardous material liquids

The requirement for spill control in a room or area is based on two items. The first is that the storage container(s) have a capacity of more than 55 gallons (208 L). The second is that the aggregate capacity of multiple vessels be more than 1,000 gallons (3785 L). The area, once determined to require spill control, must be protected so that the containment area will handle the release from the largest container in the area.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. No additional cost impact, as this clarifies intent of current code.

F209-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved because the volume allowed by this proposal without spill control and secondary containment is excessive. This would change the number from 50 gallons to 1000 gallons. (Vote: 14-0)

Assembly Action:

None

F209-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Robert Davidson, Davidson Code Concepts, LLC, representing FCAC (rjd@davidsoncodeconcepts.com); Richard Kluge (richard.kluge@ericsson.com); Jeffrey Betz (jbetz@att.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

1206.2.11.5 Spill control and neutralization. Where required by Section 1206.2.12, 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:

1. For batteries 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.
2. For batteries 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.

1206.2.11.5.1 Communication Utilities. The requirements of Section 1206.2.11.5 shall only apply when the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) for lead acid and nickel cadmium battery systems operating at less than 50 VAC and 60 VDC that are located at facilities under the exclusive control of communications utilities and those facilities comply with NFPA 76 in addition to applicable requirements of this code.

Commenter's Reason: This public comment incorporates and clarifies the code industry's basic quantity requirements for spill control as it applies to telecommunication utility facilities utilizing lead acid or nickel cadmium batteries. It provides a trigger for when to require spill control measures that corresponds to what is required for high hazard occupancies. In the IFC, you typically must be a high hazard occupancy before there is a requirement for spill control, then you must have individual containers exceeding 55 gallons in capacity or an aggregate amount exceeding 1,000 gallons.

5004.2.2 Secondary containment for hazardous material liquids and solids. *Where required by Table 5004.2.2 buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall be provided with secondary containment in accordance with this section where the capacity of an individual vessel or the aggregate capacity of multiple vessels exceeds both of the following:*

1. *Liquids: Capacity of an individual vessel exceeds 55 gallons (208 L) or the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L).*

Since the lead-acid or nickel cadmium batteries regulated by this portion of the code do not exceed 50 gallons of electrolytes individually the 'exceeding 55 gallons' trigger would not come in to play, so only the '1,000-gallon aggregate' threshold is being brought over.

The committee's reason for denial was:

"This proposal was disapproved because the volume allowed by this proposal without spill control and secondary containment is excessive. This would change the number from 50 gallons to 1000 gallons."

This would not be accurate, though the trigger would now be a 1000 gallon aggregate, the change is targeted only to telecommunication utility facilities wherein individual batteries do not exceed 50 gallons. So if a spill was to occur due to the failure of a battery casing the amount would be 50 gallons. You would need the simultaneous failure of 20 batteries to

reach 1000 gallons, an unlikely event. It's important to acknowledge that even if this was a high hazard occupancy, 50 gallon containers would not trigger spill containment until an aggregate of 1000 gallons was reached. In essence, the IFC already has determined the amounts as acceptable.

The suggested language has been restructured to leave the existing language as is and to instead add a section advising when to apply the spill control requirements to a telecommunications utility facility. This would apply only to spaces dedicated to the telecommunications activities, it would not apply in a mixed use occupancy.

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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
No additional cost impact, as this clarifies intent of current code.

F209-18

F212-18

IFC: Chapter 22, 202 (New)

Proposed Change as Submitted

Proponent: Ellie Klausbruckner, representing Klausbruckner & Associates, Inc. (ek@klausbruckner.com); Kevin Scott, representing KH Scott & Associates LLC (khscottassoc@gmail.com)

2018 International Fire Code

Revise as follows

CHAPTER ~~22~~ COMBUSTIBLE DUST-PRODUCING OPERATIONS

~~SECTION 2201 GENERAL~~

Delete without substitution

~~**2201.1 Scope.** The equipment, processes and operations involving dust explosion hazards shall comply with the provisions of this code and NFPA 652.~~

~~**2201.2 Permits.** Permits shall be required for *combustible dust* producing operations as set forth in Section 105.6.~~

~~SECTION 2202 DEFINITION~~

~~**2202.1 Definition.** The following term is defined in Chapter 2:
COMBUSTIBLE DUST.~~

~~SECTION 2203 PRECAUTIONS~~

~~**2203.1 Owner responsibility.** The owner or operator of a facility with operations that manufacture, process, blend, convey, repackage, generate or handle potentially combustible dust or combustible particulate solids shall be responsible for compliance with the provisions of this code and NFPA 652.652.~~

~~**2203.2 Dust hazard analysis (DHA).** The requirements of NFPA 652 apply to all new and existing facilities and operations with combustible dust hazard. Existing facilities shall have a dust hazard analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.652.
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.~~

~~**2203.3 Sources of ignition.** Smoking, the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in areas where *combustible dust* is generated, stored, manufactured, processed or handled.~~

~~**2203.4 Housekeeping.** Accumulation of *combustible dust* shall be kept to a minimum in the interior of buildings. Accumulated *combustible dust* shall be collected by vacuum cleaning or other means that will not place *combustible dust* into suspension in air. Forced air or similar methods shall not be used to remove dust from surfaces.~~

~~SECTION 2204 ADDITIONAL REQUIREMENTS~~

~~**2204.1 Specific hazards standards.** The industry or commodity specific codes and standards listed in Table 2204.1 shall be complied with based on the identification and evaluation of the specific fire and deflagration hazards that exist at a facility.~~

**TABLE 2204.1
SPECIFIC HAZARDS STANDARDS**

STANDARD	SUBJECT
NFPA 61	Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electrical Code
NFPA 85	Boiler and Combustion System Hazards Code
NFPA 120	Standard for Fire Prevention and Control in Coal Mines
NFPA 484	Standard for Combustible Metals
NFPA 654	Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
NFPA 655	Standard for the Prevention of Sulfur Fires and Explosions
NFPA 664	Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

Add new text as follows

2201.1 Scope. The equipment, processes and operations involving dust explosion hazards and use or handling of combustible dust shall comply with the provisions of this chapter

Exceptions:

1. In an unsprinklered building, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 5 pounds (2.3 kg) or 0.7 cu ft. (0.019822 m³)
2. In a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 10 pounds (4.5 kg) or 1.4 cu ft. (0.039644 m³)
3. Storage and use of consumer materials in Group B or R occupancies.
4. Storage and use of commercially packaged materials in Group M occupancies.
5. Materials displayed in original packaging in Group M occupancies and intended as building materials or for personal or household use.
6. Storage of sealed containers of combustible dust at facilities not associated with an operation that uses, handles or generates combustible dust.
7. Materials stored or used in farm buildings or similar occupancies intended for on-premises agricultural purposes.

2201.2 Permits. Permits shall be required for combustible dust-producing operations as set forth in Section 105.6.

2202 DEFINITIONS

2202.1 Definitions. The following terms are defined in Chapter 2:

Dust Collection System

Combustible Dust

2203 DUST EXPLOSION PREVENTION

2203.1 Critical Depth Layer.

The maximum dust layer on all surfaces, including but not limited to walls, ceilings, beams, equipment, furniture, pipes and ducts, shall not exceed the Critical Depth Layer specified in Table 2203.1. The critical depth layer depth is permitted to be adjusted for explosion hazard further evaluated in accordance with one of the following:

1. Section 6.1.1.3 of NFPA 654.
2. Section 4.2.2 of NFPA 664 for wood flour.

Accumulated combustible dust shall be collected by one of the methods listed in 2203.5.

**Table 2203.1
Critical Depth Layer**

Type of Dust	Critical Depth Layer (Inches)
Wood Flour	1/8
All Other Dusts	1/32

For SI: 1 inch = 25.4 mm

2203.2 Dust Producing and Dust Handling Equipment. Dust producing equipment and dust handling equipment, including but not limited to vacuums, dust collection systems, dryers, mixers, blenders, separators, conveyors, storage containers, silos or other similar devices shall be listed and shall be maintained in accordance with the manufacturer's recommended standards.

2203.2.1 Signages and Markings. Signages and markings shall be provided in accordance with Section 2203.2.1.1 through 2203.2.1.3.

2203.2.1.1 Deflagration Vent Discharge Area Markings. Where dust collection systems and other equipment, systems, or systems components are provided with deflagration vents, the area within the deflagration vent's discharge area shall be marked in an approved manner.

2203.2.1.2 Caution Signs.

Signs shall be posted near the dust containing equipment with deflagration vents that reads as follows:

CAUTION: THIS EQUIPMENT CAN CONTAIN EXPLOSIVE DUST.

KEEP OUTSIDE THE MARKED AREA WHILE EQUIPMENT IS OPERATING.

2203.2.1.3 Warning Signs. Where dust collection systems and other equipment, systems, or systems components are provided with deflagration vents, vent closures shall be clearly marked as follows:

WARNING: EXPLOSION RELIEF DEVICE. STAY CLEAR.

2203.3 Dust Collection and Conveying Systems. Dust collection and conveying systems shall be in accordance with Sections 2203.3.1 through 2203.3.3.

2203.3.1 Dust Collection Systems. Dust collection systems shall be designed to collect dust emissions from dust producing equipment at the point of generation. Dust collection systems shall be in accordance with Section 511 of the International Mechanical Code.

Exception: Closed systems using listed equipment and designed in accordance with manufacturer's recommendations and specifications, where cleanouts are provided in accordance with Section 2203.3.3.

Heating, ventilation, and air conditioning (HVAC) systems shall not be used as the means to collect dusts from localized sources.

2203.3.1.1 Location. Dust collectors shall be located outside of buildings.

Exceptions:

1. Dust collectors inside of buildings complying with Section 511 of the International Mechanical Code.
2. Wet-type dust collectors when specifically listed for the type of dust conveyed shall be permitted inside of buildings where in accordance with the manufacturer's instructions and specifications.
3. Dust collectors designed to specific NFPA standards listed in Table 2204.1 for the specific type of dust conveyed.

2203.3.1.2 Minimum Conveying Velocities. The minimum velocities within ducts used as part of the dust collection system shall be in accordance with Table 2203.3.1.2.

**Table 2203.3.1.2
Minimum Conveying Velocities**

Type of Product	Feet Per Minute
Fine light dust, such as cotton, lint, and wood flour (100 mesh and under)	2000 (10 m/s)
Dry dust such as fine rubber molding powder	2500 (13 m/s)
Average dust such as sawdust, grinding dust, coal dust	3500 (18 m/s)
Heavy dust such as metal turnings, including aluminum and magnesium powder	4000 (20 m/s)

2203.3.2 Plastic Ducts and Conveying Systems. Plastic, fiberglass, other nonconductive ducts, duct liners or pipes shall not be used as part of ducts and conveying systems. Ductwork utilizing a combustible lining shall be permitted only in high impact areas and where approved. Flexible hose shall be permitted if designed and installed in accordance with the following requirements:

1. Manufactured of static dissipative construction.
2. Used only for connections and isolation purposes.
3. Limited to 18 inches (457 mm) in length.
4. Properly grounded.

2203.3.3 Cleanouts. Openings shall be provided in enclosed equipment and conveyors to allow access to all parts of the equipment and conveyors to permit inspection, cleaning, maintenance, and the effective use of portable extinguishers or hose streams. Cleanouts for ducts used as part of the dust collection system shall be in accordance with the International Mechanical Code.

2203.4 Sources of Ignition. Sources of Ignition shall be controlled in accordance with Sections 2203.4.1 through 2203.4.9.5.

2203.4.1 Classified Electrical. Classified electrical shall be in accordance with NFPA 70. Electrical motors and electrical components of the equipment shall not be installed in the dust laden air stream unless listed for Class II, Division 1 locations.

2203.4.2 Static Electricity. Bonding and grounding is required to minimize accumulation of static electric charge in the following locations:

1. Dust producing equipment
2. Dust collection system.
3. Pneumatic dust conveying systems conveying combustible dust from one location to another, combustible dust conveyors, piping and conductive components. Conveying systems include transport modes such as railcars, hopper cars, boxcars, tank cars and trucks into which or from which commodities or products are pneumatically conveyed.
4. Conveying systems using metallic piping.

2203.4.3 Hot Works. Hot work and similar spark producing operations shall not be conducted in or adjacent to combustible dust producing areas unless precautions have been taken to provide safety. Hot work shall be permitted only in safe, designated areas in accordance with Chapter 35. Hot work is prohibited on equipment that is operating.

2203.4.3.1 Signs. Conspicuous signs with the following warning shall be posted in the vicinity of combustible dust producing areas or in the vicinity of combustible dust use:
NO WELDING. THE USE OF WELDING OR CUTTING EQUIPMENT IN OR NEAR THIS AREA IS DANGEROUS BECAUSE OF FIRE AND EXPLOSION HAZARDS. WELDING AND CUTTING SHALL BE DONE ONLY UNDER THE SUPERVISION OF THE PERSON IN CHARGE.

2203.4.4 Hot Surfaces and Hot Equipment. In areas where a dust explosion hazard or dust flash fire hazard exists, the temperature of external surfaces, shall be maintained below 80 percent (in degrees Celsius) of the lower of the dust surface ignition temperature or the dust-cloud ignition temperature for worst-case dusts. External surfaces shall include

but not limited to:

1. Compressors.
2. Steam, water or process piping.
3. Ducts.
4. Conveyors.
5. Process equipment.

Where steam pipes or hot surfaces occur in dust producing or dust handling areas, accumulation of dust on the surfaces shall be minimized by an approved method.

Exception: Drying apparatus listed for the intended use and installed in accordance with the manufacturer's instructions.

2203.4.5 Powered Industrial Trucks. Powered industrial trucks used in electrically classified areas shall be listed for such use.

2203.4.6 Smoking Prohibited. Smoking shall be prohibited in or adjacent to dust producing or dust handling areas. "No Smoking" signs complying with Section 310 shall be conspicuously posted in such areas. Smoking shall be permitted only in designated areas.

2203.4.7 Spark Producing Devices. Spark-producing devices shall not be located within 20 feet (6096 mm) of areas requiring classified electrical unless separated by a permanent partition.

2203.4.8 Self-heating materials. Materials in silos and other large storage piles of particulates prone to self-heating shall be in accordance with Section 8.5.11 of NFPA 652.

2203.4.9 Open Flames and Fuel Fired Equipment. Open flames and fuel fired equipment shall be in accordance with Section 2203.4.9.1 through 2203.4.9.5.

2203.4.9.1 Release or Airborne Combustible Dust. Production, maintenance or repair activities that have the potential to release or force combustible dust to become airborne shall not be conducted within 35 feet (11 m) of an open flame or pilot flame.

2203.4.9.2 Space Heaters. Fuel-fired space heaters drawing local ambient air shall not be located within electrically classified areas. Space heating appliances in dust producing or dust handling areas shall be located where not subject to accumulation of deposits of combustible dust.

2203.4.9.3 Equipment Listing. Fuel-fired process equipment shall be listed for its intended use and shall be operated and maintained in accordance with the manufacturer's instructions.

2203.4.9.4 Inspection and Preventative Maintenance. Inspection and maintenance of fuel-fired process equipment shall include verification that significant combustible dust accumulations do not exist within or around the equipment.

2203.4.9.5 Sources of Combustion Air. In Class II electrically classified locations, heating units shall be provided with a source of combustion air ducted directly from the building exterior or from an unclassified location.

2203.5 Housekeeping. Accumulation of combustible dust on surfaces inside buildings shall be maintained below the critical depth layer in Section 2203.1. Pressurized air or similar methods shall not be used to remove dust from surfaces. Accumulated combustible dust shall be collected by one of the following methods:

1. Portable vacuum cleaners listed for use in Class II, Group G, Division 1 atmospheres as defined in NFPA 70.
2. Dust collection systems.
3. Other approved means that will not place combustible dust into suspension in air.

2203.6 Standard Operational Procedures. Dust producing equipment and all associated equipment including dust collection equipment shall be maintained in accordance with the manufacturer's instructions and specifications and applicable codes. The inspection, testing and maintenance program shall include the following, as applicable:

1. Fire and explosion protection and prevention equipment, as applicable, in accordance with the applicable NFPA standards.
2. Dust control equipment.
3. Control of potential ignition sources.
4. Electrical, process and mechanical equipment, including applicable process interlocks.
5. Lubrication of bearings for dust collection, dust handling and dust producing equipment.
6. Additional maintenance in accordance with the manufacturer's instructions and specifications for dust collection, dust handling and dust producing equipment.

1. Records shall be kept of maintenance and repairs performed. The standard operating procedures shall be submitted to the fire code official for review and approval. The written standard operating procedures shall be signed by the person responsible for facility operations.

2203.7 Emergency Response Plan. A written emergency response plan shall be developed for preventing, preparing for and responding to work-related emergencies including but not limited to fire and explosion. The following information shall be developed into the plan:

1. Identification of dust hazards.
2. Identification and location of all utilities to affected areas.
3. Site plans or floor plans locating utility shut-off controls including water, gas and power.
4. Identify the potential for explosion.
5. Identify the location of fire extinguishing equipment compatible with the hazards present.
6. Any additional information required by the fire code official.

2203.8 Training. The plans and procedures required in Sections 2203.5, 2203.6 and 2203.7 shall be approved by the fire code official. The plans and procedures shall be reviewed annually and updated as required by process changes. Initial and annual refresher training shall be provided to employees who are involved in operating, maintaining and supervising facilities that handle combustible dust. Initial and annual refresher training shall include:

1. Workplace hazards.
2. General orientation, plant diagrams and plant safety rules.
3. Process description or flowchart.
4. Equipment operation, safe startup and shutdown, and response to hazard conditions or an incident.
5. The location and use of all related fire and explosion protection and prevention systems.
6. Equipment maintenance requirements and practices, including visual inspections of conveyors and ducts.
7. Housekeeping requirements, including the maintenance of the critical depth layer in Section 2203.1.
8. Emergency response plans as required in Section 2203.7.

The employer shall maintain records of initial and annually training and review.

2204 DUST EXPLOSION SCREENING TESTS

2204.1 Combustibility and Explosivity Tests. Where combustibility or explosivity screening tests are required to analyze the combustible dust as part of compliance with Section 414.1.3 of the International Building Code and Section 104.7 of the this code, it shall be in accordance with Section 5.4 of NFPA 652.

2204.2 Samples. Representative samples for the screening test shall be obtained in accordance with Section 5.5 of NFPA 652.

2205 STANDARDS

2205.1 Specific Hazards Standards. The fire code official is authorized to enforce additional industry or material specific provisions of the codes and standards listed in Table 2205.1 as applicable to prevent and control dust explosions.

**Table 2205.1
Explosion Protection Standards**

<u>Standard</u>	<u>Subject</u>
<u>NFPA 61</u>	<u>Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities</u>
<u>NFPA 69</u>	<u>Standard on Explosion Prevention Systems</u>
<u>NFPA 70</u>	<u>National Electrical Code</u>
<u>NFPA 77</u>	<u>Recommended Practice on Static Electricity</u>
<u>NFPA 85</u>	<u>Boiler and Combustion System Hazards Code</u>
<u>NFPA 120</u>	<u>Standard for Fire Prevention and Control in Coal Mines</u>
<u>NFPA 484</u>	<u>Standard for Combustible Metals</u>
<u>NFPA 652</u>	<u>Standard on the Fundamentals of Combustible Dust</u>
<u>NFPA 654</u>	<u>Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids</u>
<u>NFPA 655</u>	<u>Standard for the Prevention of Sulfur Fires and Explosions</u>
<u>NFPA 664</u>	<u>Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities</u>

2205.1.1 Dust Hazard Analysis. If a dust hazard analysis (DHA) is required by the fire code official to new or existing facilities and operations, it shall be in accordance with NFPA 652. The DHA for existing facilities shall be in accordance with Section 7.1.2 of NFPA 652.

DUST COLLECTION SYSTEM. A combination of equipment designed to contain, capture and collect airborne combustible dusts.

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

77-14:

Recommended Practice on Static Electricity

Reason: Combustible dust continues to be an issue of concern with AHJs. While references to NFPA for unique dust hazards can be useful, the entire protection cannot just evolve around ten different NFPA Standards. It is simply impractical to apply standards and only standards without any additional guidance for code users, especially fire inspectors in their daily work. One of the premises in the IFC development has been that the code should contain information for use in the field, while items for plan review can be referenced to other standards since plan review is normally conducted in the office where the information in the standards is accessible. In the field, the inspector needs information to apply to situation in front of him or her.

Similar concerns arise from application of Flammable Finishes that involve spraying and/or dipping operations using flammable liquids. Except for unique applications, it has not been necessary to analyze the size of the flammable liquids droplets/vapors, flammability of materials, etc. Providing appropriate hazard mitigations, including sources of ignition, exhaust, etc. Chapter 24 addresses concerns for a wide range of flammable liquids without the need for inspectors to delve into 10 different standards. This proposed new chapter 22 takes a similar approach. This code change does not deter from the current Chapter, in that those standards are still imbedded in this new proposed chapter, as appropriate. But the code change provides additional guidelines on how to mitigate dust accumulation and sources of ignition. It also provides guidelines on housekeeping, employee training, operational procedures.

If fire plan reviewer or inspector has additional concerns, it still leaves the door open to requiring additional NFPA Standards and Dust Hazard Analysis. That option is still available with this proposed revision under Section 2205.

Section 2201.1: Exception 1 allows 5 lbs. to address small laboratory type use. Additionally combustible dust has a fire hazard rating of 2 and in some rare cases 3. When comparing to MAQs of other materials with fire hazard rating of 2 typical basic MAQs for these materials are 25 lbs and other materials with fire hazard rating of 3 have typical basic MAQs of 10 lbs. Doubling for a sprinklered building, in Exception 2, also puts things in line with other hazardous materials allowances. The remaining exceptions are listed based on similar exceptions in standards due to lack of major incidences in commonly encountered storage and uses.

Section 2203.1: Collection of accumulated dust is the single most critical method of dust explosion prevention. It is one of the simpler methods of evaluating and addressing prevention. The critical depth layer in Table 2203.1 provides a very general approach for fire inspectors, while Section 2203.1 allows for more complicated analysis by adjusting the critical layer depth and/or determining explosion hazard found in NFPA 654 & 664.

Section 2203.2: It is difficult for an inspector to determine if the equipment is inherently safe and/or the associated electrical has been designed properly unless the equipment is listed. This section also requires maintenance in accordance with manufacturer's instructions. Subsections on markings and signs are provided to avoid injury to personnel if vent panels are dislodged or in the event of an incident.

Section 2203.3.1: Dust collection systems need to draw at the point of generation for maximum efficiency. The exception is included since closed system use of combustible dust where dust is not open to the environment of the room does not need a dust collector. References to mechanical code is provided for location of dust collection system.

Section 2203.3.1.1: The general requirement is to locate the dust collector outside of buildings. Exceptions are added to address 1) IMC allowances, 2) wet-type dust collectors which when designed and installed per manufacturer's cut sheets do not pose an explosion hazard since the dust is wetted and therefore is inherently safer inside the building, and 3) references to the different NFPA standards for specific dusts when the dust and the dust collection is detailed and specific to a particular NFPA standard for mitigation of dust explosion.

Section 2203.3.1.2: Source is from California Mechanical Code Table 505.2. These velocities have been used for decades and provide a minimum velocity to move the various particles. Particles of different types and weights require different velocities to properly move the particles.

Section 2203.3.2: Grounding and bonding is required for ducts and conveyors. Added precautions are used for types of ducts and piping that will be difficult to dissipate static electricity.

Section 2203.3.3: In addition to the cleanouts proposed for the dust collection in the International Mechanical Code, a method is needed to access all parts of a conveying system for cleaning and inspection. Lack of cleanouts was one of issues that resulted in the explosion in the Imperial Sugar Company, Port Wentworth GA.

Section 2203.4.1: Although these requirements already apply, sending the code user, who may otherwise be unfamiliar to the National Electric Code is appropriate.

Section 2203.4.2: To avoid sources of ignition from static discharge, grounding and bonding is required for equipment that come in contact with combustible dust.

Section 2203.4.3: Similar language is used in IFC Section 2403.2.7 for Flammable Finishes. Limiting hot works to designated area is critical to avoid additional sources of ignition within areas where combustible dust is used.

Section 2203.4.4: Avoiding heated surfaces in areas subject to explosion hazard is very important aspect of controlling sources of ignition. Some of the language is from IFC Section 2404.6.1.2 for Flammable Finishes and some is from other standards.

Section 2203.4.5: Similar language in IFC 2403.2.8 for Flammable Finishes.

Section 2203.4.6: Similar language in IFC Section 2403.2.6 for Flammable Finishes.

Section 2203.4.7: Similar language in IFC Section 2403.2.2 for Flammable Finishes.

Section 2203.4.8: This section is derived from and references NFPA 652. It addresses unique and very hazardous condition for self-heating materials.

Section 2203.4.9: Basic safety requirements need to be maintained in the event that open flame or fuel fired equipment is needed as part of the processes. These sections provide guidelines on how to safely use these equipment and reduce the probability of an incident.

Section 2203.5: Basic housekeeping is required to limit the accumulation of dust specified in Section 2203.1.

Section 2203.6: Standard Operational Procedures is the business owner's commitment to maintaining the operations safe and equipment in good working condition.

Section 2203.7: Emergency response plan is important for facilities where the a potential dust explosion exists.

Section 2203.8: Training is important for facilities with potential dust explosion hazards to encourage employees into maintaining safe conditions within the facility. Educating employees in understanding that maintenance and housekeeping are key life safety aspects in a facility is important.

Section 2204: Dust explosion screening tests may be necessary for specific types of dust. This section allows the AHJ to require and sends the user to the appropriate NFPA standard and section.

Section 2205: If unique hazards that are not covered by this chapter come up [e.g. design of large dryers in large agricultural and food processing facilities], this section allows fire code official to use these NFPA Standards for specific hazards. Similar language is existing in the current code.

Dust Collection System: New definition is provided in Chapter 2.

Bibliography: International Fire Code, ICC, Chapter 24.

Also the following referenced NFPA Standards:

NFPA 61: Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities

NFPA 69: Standard on Explosion Prevention Systems

NFPA 77: Recommended Practice on Static Electricity

NFPA 85: Boiler and Combustion System Hazards Code

NFPA 120: Standard for Fire Prevention and Control in Coal Mines

NFPA 484: Standard for Combustible Metals

NFPA 652: Standard on the Fundamentals of Combustible Dust

NFPA 654: Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids

NFPA 655: Standard for the Prevention of Sulfur Fires and Explosions

NFPA 664: Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Please note that the proposal may increase or decrease the cost impact to construction. It highly depends on the type and scale of combustible dust use. In most cases, we believe not applying NFPA 652 for all cases will reduce the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NFPA 77-14 with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F212-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 2201.1 Scope. The equipment, processes and operations involving dust explosion hazards and use or handling of combustible dust shall comply with the provisions of this chapter

Exceptions:

~~1. In an unsprinklered building, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 5 pounds (2.3 kg) or 0.7 cu ft. (0.019822 m³)~~

~~2. In a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, dust production or use, including use-open and use-closed systems, where the quantity does not exceed 10 pounds (4.5 kg) or 1.4 cu ft. (0.039644 m³)~~

3. Storage and use of consumer materials in Group B or R occupancies.

4. Storage and use of commercially packaged materials in Group M occupancies.

5. Materials displayed in original packaging in Group M occupancies and intended as building materials or for personal or household use.

6. Storage of sealed containers of combustible dust at facilities not associated with an operation that uses, handles or generates combustible dust.

7. Materials stored or used in farm buildings or similar occupancies intended for on-premises agricultural purposes.

Committee Reason: This proposal was approved as it provides more flexibility as the provisions provide practical tools to assess dust hazards along with exceptions that provide quick guidance on applicability. The modification removes the first two footnotes from proposed section 2201.1 which sets the scope for the chapter. These two footnotes are removed as they do not have a scientific basis to address based simply on weight and whether or not sprinklers are provided. (Vote: 10-3)

Assembly Action:

None

F212-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org); Kevin Scott, representing FCAC (khscottassoc@gmail.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

2203.1 Critical Depth Layer. _

The maximum dust layer on all surfaces, including but not limited to walls, ceilings, beams, equipment, furniture, pipes and ducts, shall not exceed the Critical Depth Layer specified in Table 2203.1. The critical depth layer ~~depth~~ is permitted to be adjusted for explosion hazard further evaluated in accordance with one of the following:

1. Section 6.1.1.3 of NFPA 654.
2. Section 4.2.2 of NFPA 664 for wood flour.

Accumulated combustible dust shall be collected by one of the methods listed in Section 2203.5.

2203.2 Dust Producing and Dust Handling Equipment. Dust producing equipment and dust handling equipment, including but not limited to vacuums, dust collection systems, dryers, mixers, blenders, separators, conveyors, ~~storage~~

~~containers, silos or other similar devices~~ equipment shall be listed and shall be maintained in accordance with the manufacturer's ~~recommended standards~~ instructions.

2203.2.1 Signages—Signs and Markings. ~~Signages—Signs~~ and markings shall be provided in accordance with Section 2203.2.1.1 through 2203.2.1.3.

2203.2.1.1 Deflagration Vent Discharge Area Markings. Where dust collection systems and other equipment, systems ~~, or systems~~ system components are provided with deflagration vents, the area within the deflagration vent's discharge area shall be marked in an approved manner.

2203.2.1.2 Caution Signs. Signs shall be posted near the dust containing equipment with deflagration vents that reads as follows:

CAUTION—THIS EQUIPMENT CAN CONTAIN EXPLOSIVE DUST.

KEEP OUTSIDE THE MARKED ~~AREA~~ AREAS WHILE EQUIPMENT IS OPERATING.

2203.2.1.3 Warning Signs. Where dust collection systems and other equipment, systems ~~, or systems~~ system components are provided with deflagration vents, vent closures shall be clearly marked as follows:

WARNING

—EXPLOSION RELIEF DEVICE. STAY CLEAR.

2203.3.1 Dust Collection Systems. Dust collection systems shall be designed to collect dust emissions from dust producing equipment at the point of generation. Dust collection systems shall be in accordance with Section 511 of the International Mechanical Code.

Exception:

Closed systems using listed equipment and designed in accordance with manufacturers recommendations and specifications, where cleanouts are provided in accordance with Section 2203.3.3.

Heating, ventilation, and air conditioning (~~HVAC~~) systems shall not be ~~used as the means to collect dusts from localized sources~~ combined or interconnected with dust collection systems.

2203.3.1.1 Location. Dust collectors shall be located outside of buildings.

Exceptions:

1. Dust collectors inside of buildings complying with Section 511 of the International Mechanical Code.
2. Wet-type dust collectors when specifically listed for the type of dust conveyed shall be permitted inside of buildings where in accordance with the manufacturers instructions and specifications.
3. Dust collectors designed to specific NFPA standards listed in Table ~~2204.1~~ 2205.1 for the specific type of dust conveyed.

**Table 2203.3.1.2
Minimum Conveying Velocities**

Type of Product	Feet Per Minute
Fine light dust; such as cotton, lint, and wood flour (100 mesh and under)	2000 (10 m/s)
Dry dust such as fine rubber molding powder	2500 (13 m/s)
Average dust such as sawdust, grinding dust, coal dust	3500 (18 m/s)
Heavy dust such as metal turnings, including aluminum and magnesium powder	4000 (20 m/s)

2203.3.2 Plastic Ducts and Conveying Systems. Plastic, fiberglass, other nonconductive ducts, duct liners or pipes shall not be used as part of ducts and conveying systems. Ductwork utilizing a combustible lining shall be permitted only in high impact areas and where approved. Flexible hose shall be permitted if designed and installed in accordance with the following requirements:

1. Manufactured of static dissipative construction.
2. Used only for ~~connections~~ connection and isolation purposes.

3. Limited to 18 inches (457 mm) in length.
4. Properly grounded.

2203.4.3 Hot Works/Work. Hot work and similar spark producing operations shall not be conducted in or adjacent to combustible dust producing areas unless precautions have been taken to provide safety. Hot work shall be permitted only in safe, designated areas in accordance with Chapter 35. Hot work is prohibited on equipment that is operating.

2203.4.3.1 Signs. Conspicuous signs with the following warning shall be posted in the vicinity of combustible dust producing areas or in the vicinity of combustible dust use:

NO WELDING

~~THE USE OF WELDING OR CUTTING EQUIPMENT IN OR NEAR THIS AREA IS DANGEROUS BECAUSE OF FIRE AND EXPLOSION HAZARDS. WELDING AND CUTTING SHALL BE DONE ONLY UNDER THE SUPERVISION OF THE PERSON IN CHARGE.~~

2203.4.9.1 Release or Airborne Combustible Dust. ~~Production~~ Open flames or pilot flames shall be separated by a minimum of 35 ft (11 m) from production, maintenance or repair activities that ~~have the potential to can~~ release or force cause combustible dust to become airborne ~~shall not be conducted within 35 feet (11 m) of an open flame or pilot flame.~~

2203.4.9.5 Sources of Combustion Air. In Class II electrically classified locations, ~~heating units fuel-fired appliances~~ shall be provided with a source of combustion air ducted directly from the building exterior or from an unclassified location.

2203.6 Standard Operational Procedures. Dust producing equipment and all associated equipment including dust collection equipment shall be maintained in accordance with the manufacturer's instructions and specifications and applicable codes. The inspection, testing and maintenance program shall include the following, as applicable:

1. Fire and explosion protection and prevention equipment, as applicable, in accordance with the applicable NFPA standards.
2. Dust collection and control equipment.
3. Control of potential ignition sources.
4. Electrical, process and mechanical equipment, including applicable process interlocks.
5. Lubrication of bearings for dust collection, dust handling and dust producing equipment.
6. Additional maintenance in accordance with the manufacturers instructions and specifications for dust collection, dust handling and dust producing equipment.

~~Records shall be kept~~ of maintenance and repairs ~~performed~~ shall be maintained. The standard operating procedures shall be submitted to the fire code official for review and approval. The written standard operating procedures shall be signed by the person responsible for facility operations.

2203.7 Safety and Emergency Response Plan. A written safety and emergency response plan shall be developed for preventing, preparing for and responding to work-related emergencies including but not limited to fire and explosion. The following information shall be developed into the plan:

1. Identification of dust hazards.
2. Identification and location of all utilities to affected areas.
3. Site plans or floor plans locating utility shut-off controls including water, gas and power.
4. Identify the potential for explosion.
5. Identify the location of fire extinguishing equipment compatible with the hazards present.
6. Any additional information required by the fire code official.

2203.8 Training. The plans and procedures required in Sections 2203.5, 2203.6 and 2203.7 shall be approved by the fire code official. ~~The plans and procedures shall be reviewed annually and updated as required by process changes.~~ Initial and annual refresher training shall be provided to employees who are involved in operating, maintaining and supervising facilities that handle combustible dust. Initial and annual refresher training shall include:

1. Workplace hazards.
2. General orientation, plant diagrams and plant safety rules.
3. Process description or flowchart.
4. Equipment operation, safe startup and shutdown, and response to hazard conditions or an incident.
5. The location and use of all related fire and explosion protection and prevention systems.
6. Equipment maintenance requirements and practices, including visual inspections of conveyors and ducts.
7. Housekeeping requirements, including the maintenance of the critical depth layer in Section 2203.1.
8. Emergency response plans as required in Section 2203.7.

The employer shall maintain records of initial and annually training and review.

2205.1.1 Dust Hazard Analysis. If a dust hazard analysis (DHA) is required by the fire code official to new or existing facilities and operations, it shall be in accordance with NFPA 652. The ~~DHA for existing dust hazard analysis for existing~~ facilities shall be in accordance with Section 7.1.2 of NFPA 652.

Commenter's Reason: 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 firesafety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>
This proposal was Approved as Modified by the committee. This Public Comment merely provides some editorial revisions and clarifications to the Chapter. The revised sections are listed below:

Section 2202.1: editorial

Section 2203.1: editorial

Section 2203.2: two revisions occur to this section. First, containers and silos are removed because storage containers and vessels are not typically listed. Secondly, the section will refer to the manufacturer's instructions. The instructions need to be followed. If they happen refer to a standard, then that standard is followed. However, if they don't reference a standard, the instructions still need to be followed.

Section 2203.2.1: this term is changed to "signs" to be consistent with Section 2203.4.3.1.

Section 2203.2.1.1: editorial

Section 2203.2.1.2: the language on the sign is editorially revised and formatted to match other sections in the code.

Section 2203.2.1.3: editorial and formatting revisions.

Section 2203.3.1: HVAC is deleted. It is not needed, and this is not typical throughout code. Also, it is revised to clarify that the ventilation system and dust collection system are not to be interconnected.

Section 2203.3.1.1: corrected so it references the appropriate table

Table 2203.3.1.2: editorial to be consistent will other items in the table.

Section 2203.3.2: editorial. Section 2203.4: editorial.

Section 2203.4.3: editorial, correct term is hot work.

Section 2203.4.3.1: editorial and formatting.

Section 2203.4.4: editorial.

Section 2203.4.9.1: Section 2203.4 and its subsections regulate "ignition sources", therefore, this section is rewritten to require that the ignition sources are controlled when within 35 ft of potentially hazardous activities. There is no change in intent or application.

Section 2203.4.9.5: This section is revised to state "fuel-fired appliances" rather than heating units. The change to fuel-fired appliances allows it to apply to all appliances, not just heaters.

Section 2203.6: editorial.

Section 2203.7: This section is revised to change the title of the plan to the "Safety and Emergency Response Plan". When the title is simply "emergency response plan", it can be interpreted as FD response. That is not the intended application. Therefore, the title is revised and consistent with the title of Safety and Emergency Response Plan used in Section 5707.3.

Section 2203.8: editorial.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

These revisions are editorial and for clarification.

Public Comment 2:

Proponent: Kevin Scott, representing KH Scott & Associates LLC (khs cottassoc@gmail.com) ; Ellie Klausbruckner representing Klausbruckner and Associates (ek@klausbruckner.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

2203.3.2 Plastic Ducts and Conveying Systems. Plastic, fiberglass, other nonconductive ducts, duct liners or pipes shall not be used as part of ducts and conveying systems. Ductwork utilizing a combustible lining shall be permitted only in high impact areas and where approved. Flexible hose shall be permitted if designed and installed in accordance with the following requirements:

1. Manufactured of static dissipative construction.
2. Used only for connections to equipment and isolation purposes.
3. ~~Limited to 18 inches (457 mm) in length.~~
4. Properly grounded.

Commenter's Reason: This proposal was Approved as Modified by the committee. This Public Comment removes the limitation of 18" for flexible hoses.

The limitation on length is dependent on the type of equipment and machinery that is used. Flexible connections are necessary for vibration isolation, such as the connection from the ductwork to the machinery, and operation of moving components on equipment, such as overhead saws, routers and flying saws.

Item 2 is revised to state that flexible hoses can be used for connections to equipment. This clarifies this statement and eliminates the use of flexible hoses to simply make connections between two ends of metallic duct.

Item 3 is deleted removing the length limitation of 18 inches.

The proposed modification allows the use of flexible hoses for making connections to equipment, but they must be properly constructed and grounded.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This revision does not mandate a change. It allows the use of flexible connections for ductwork.

Public Comment 3:

Proponent: Kevin Scott, representing KH Scott & Associates LLC, Inc. (khs cottassoc@gmail.com) ; Ellie Klausbruckner representing Klausbruckner and Associates (ek@klausbruckner.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

2203.5 Housekeeping. Accumulation of combustible dust on surfaces inside buildings shall be maintained below the critical depth layer in Section 2203.1. ~~Pressurized air or similar methods shall not be used to remove dust from surfaces.~~ Accumulated combustible dust shall be collected by one of the following methods:

1. Portable vacuum cleaners listed for use in Class II, Group G, Division 1 atmospheres as defined in NFPA 70.
2. ~~Dust collection systems~~ Scoops, brooms, brushes and shovels.
3. Water washdown.
34. Other approved means that will not place combustible dust into suspension in air.

Use of compressed or pressurized air shall only be permitted where other methods of cleaning have been used and additional cleaning is necessary, or areas to be cleaned cannot be accessed safely. Cleaning with pressurized air must be performed in accordance with NFPA 652, 654 or 664.

Commenter's Reason: This proposal was Approved as Modified by the committee. This Public Comment revises the allowed methods of cleaning dust.

The first modification revises the strict prohibition of compressed air. The sentence prohibiting the use of compressed air is deleted, and the final paragraph is added which provides specific criteria. The NFPA standards allow the use of compressed air, but only after other methods have been used to collect as much dust as possible and failed, or in areas which cannot be safely accessed. Then, air is allowed provided that the dust producing equipment is not operating and ignition sources are controlled or eliminated.

- NFPA 652 Section 8.4.2.6.2 provides specific requirements on the use of compressed air for cleaning.
- NFPA 654 Section 8.2.2.4 provides specific requirements on the use of compressed air for cleaning.
- NFPA 664 Section 11.2.1.1 provides specific requirements on the use of compressed air for cleaning.

This modification will provide consistency with the referenced standards and allows the use of compressed air in a controlled environment. Compressed air will not be the first choice for cleaning, but it can be used as a last resort when it becomes the best choice to clean up the hazard.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

This public comment will not affect construction, this is a maintenance issue. This proposal allows the use of compressed air under specific restrictions.

Staff Analysis: Please note that F213-18 was Approved as Submitted and blended with the AM version of F212-18 would appear as shown below. F213-18 does not have any public comments. This particular PC appears to take a different approach but similar in intent.

2203.5 Housekeeping. Accumulation of combustible dust on surfaces inside buildings shall be maintained below the critical depth layer in Section 2203.1. Pressurized air or similar methods shall not be used to remove dust from surfaces. Accumulated combustible dust shall be collected by one of the following methods:

1. Portable vacuum cleaners listed for use in Class II, Group G, Division 1 atmospheres as defined in NFPA 70.
2. Dust collection systems.
3. Other approved means that will not place combustible dust into suspension in air.

Exception: Forced air or similar methods shall be permitted to remove dust in accordance with NFPA 652, NFPA 654, or NFPA 664

Public Comment 4:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing American Forest & Paper Association (rjd@davidsoncodeconcepts.com) requests Disapprove.

Commenter's Reason: The American Forest Paper Association (AF PA) has long been involved in the development and implementation of combustible dust standards promulgated by the National Fire Protection Association (NFPA), among other organizations. Relevant NFPA standards have been in existence for years and contain specific, detailed recommendations that are the product of lengthy deliberations by subject matter experts.

The International Fire Code (IFC), in Section 2204, has long recognized the validity of NFPA standards through incorporation by reference. Considering the history of work in this area by NFPA, we are concerned that F212-18 unnecessarily introduces a new set of recommendations into a space that has been fully (and competently) occupied by NFPA for decades and referenced by the IFC.

This creates the risk of inconsistencies between the various standards, leaving fire code officials and affected facilities with less, and not more, clarity regarding the appropriate standard of care that should be exercised when addressing combustible dust hazards. Each NFPA dust related standard has requirements tailored to that industry which on its face precludes a set of generic requirements applicable to all as has been included in F212-18.

In 2018 edition of the IFC, Chapter 22 was updated to bring in the new NFPA 652 standard and correlated the application of NFPA 652 and the various NFPA standards that provide requirements for specific dust producing industries. This work was done in collaboration with the Chemical Safety Board (CSB) which had reached out to the International Code Council to incorporate the new standard and improve the application of the dust hazard requirements.

Based on our review of the proposal, there are numerous instances in which the drafters fail to appreciate and account for pre-existing NFPA requirements as well as the practical implementation of combustible dust controls by fire code officials. For these reasons, we have significant concerns with any proposal to greatly expand the language of IFC Chapter 22 in a manner that does not carefully track NFPA standards and, therefore, urge that F212-18 be disapproved.

Technical issues:

Section 2201.1. Exception

The authors have attempted to carve out exceptions for application of all the chapter s requirements that do not sync with the scoping of the NFPA standards referenced and as written could allow unregulated combustible dust hazards. The relevant NFPA standards have differing scoping requirements and the proposed exemptions were extracted from two of those standards. As written and accepted by the committee the exceptions would have broader application than apparent. Scoping must be all inclusive with each situation analyzed against both NFPA 652 and the relevant material specific standard.

2203 Critical Depth Layer

The language in this section gives the appearance that there are two simple depth layer depths to apply. That would be incorrect, a review of the relevant NFPA standards provide much more information on application and modification of the application of those depths. There are also multiple methods for determining if a hazard exists and there are also criteria that specifically declare a hazard if certain conditions exist. A simple review of NFPA 654 Section 6.1.1.3 along with Section 6.1.3 documents same. The proposal has a reference error for NFPA 664, the reference should be 4.4.2, however the review path starts out at Section 4.4.1 on thru 4.4.2 which will confirm that multiple methods and additional guidance exists for that standard as well. Additionally, the correct term is wood dust, not wood flour. The language states that the sections in NFPA 654 and NFPA 664 "are permitted" to be applied. If the code official decides they are not permitting same, a multitude of options for determining the existence of a dust hazard cannot be applied by the regulated industry. In addition, NFPA 654 and NFPA 664 are not the only dust hazard standards with criteria regarding the critical depth layer. As written, other appropriate standards cannot be applied.

Section 2203.2 Dust Producing and Handling Equipment.

This section states that all listed equipment and similar equipment shall be listed . The term listing in standards and codes parlance implies a 3rd party approval for the specified function. FM or UL does not list approve the majority of the noted equipment and as a result this is a requirement that cannot be complied with, nor is there a need for such listing.

Section 2203.2.1.1 Deflagration Vent Discharge Area Markings.

This section requires that deflagration vent discharge areas be marked approved manner which is not defined nor explained as to what would comply making the requirement subjective. It also misleads the code official into believing that this requirement is all that is necessary when there are detailed provisions contained within dust hazard standards and NFPA 68 requiring analysis of the vent discharge hazards to eliminate hazards to people and/or building exposures.

Section 2303.2.1.2 Caution Signs.

This is an unnecessary and onerous requirement. In Pulp and Paper and Wood Processing facilities and chemical facilities this will require dozens of signs if not up to a hundred signs at some facilities. It is more practical to label each building or enclosure entrance (e.g. wood conveyor tunnel) where combustible dust handling or generating equipment is present with a sign stating for example: Warning: Combustible Dust Hazard Area. Avoid Dispersion of Dust . OR , Warning: Combustible Dust Hazard Area: Follow Safe Work Practices. What defines the marked areas . Is this a hazard zone? There is no defined basis for the delineation of the marked area . NFPA 68 has requirements for establishing a hazard or exclusion zone around vented dust collectors based on the dust Kst and volume of the collector but no other requirements for a marked area exists in NFPA combustible dust documents. Similar to Section 2203.2.1.1 it misleads the code official into believing that this requirement addresses the topic when there is much more detail in the referenced standards.

Section 2203.1.3 Warning Signs.

NFPA 68 Standard on Explosion Protection by Deflagration Venting (2018 Edition) requires a warning sign near vents in paragraph 11.3.4* Vent closures shall be clearly marked as follows: WARNING: Explosion relief device . Stay clear is not a requirement. This is another example of a discrepancy this proposal has with relevant NFPA standards currently

referenced by the IFC and applied against facilities. If a facility currently meets the NFPA 68 warning sign requirement it will be in violation of this proposed language causing unnecessary costs to replace all existing signs.

Section 2201.3.1 Dust Collection Systems.

This section is confusing in that exhaust systems are separate and distinct from heating, ventilation and air conditioning systems. It appears the authors are attempting to draw in a Mechanical Code requirement that is best left to that code since compliance with the IMC is a basic requirement for hazardous exhaust systems. Specifically, both Sections 501.2 and 510.4 of the IMC address the need for an independent exhaust system. This is in Chapter 5 for Exhaust Systems , not Chapter 4 Ventilation systems. This causes unnecessary confusion and again incorporates a topic that is covered in more detail in a related document.

Section 2204.3.1.1 Location.

This section neglects to include any mention of enclosureless dust collectors (EDC). EDC s are allowed per NFPA 654 and 664 if all requirements are met for the installation and should be included in the listing. The pointer to go check the referenced standards for additional permitted systems corroborates the position that the proposed changes to the IFC are inappropriate because the user still must go to the referenced standards to find ALL of the relevant requirements. There are no short cuts to the process and the proposed language is misleading in that manner.

Section 2203.3.1.2 Minimum Conveying Velocities.

The authors state that the velocities utilized come from California s Mechanical Code. That code is based upon the IAPMO Mechanical Code, not the ICC International Mechanical Code. More importantly, the referenced NFPA standards rely upon the American Conference of Governmental Industrial Hygienists Industrial Ventilation Manual for the causing a conflict. For fine Light Dust ACGIH recommends a minimum of 2,500-3,000 fpm, not reduced 2,000 fpm the authors suggest. For Dry Dust, such as fine rubber molding powder ACGIH recommends a minimum of 3,000 fpm, not the reduced number of 2,500 fpm the authors included. So not only does the proposal create conflicts with the referenced NFPA standards on dust hazards, it suggests velocities that are insufficient based upon the ACGIH Industrial Ventilation Manual.

Range of Minimum Duct Design Velocities

TABLE 5-1. Range of Minimum Duct Design Velocities

Nature of Contaminant	Examples	Design Velocity
Vapors, gases, smoke		Any desired velocity (economic optimum velocity usually 1000–2000 fpm) [5.08–10.16 m/s]
Fumes, metal smokes	Welding	2000–2500 fpm [10.16–12.70 m/s]
Very fine light dust	Cotton lint, wood flour, litho powder	2500–3000 fpm [12.7–15.24 m/s]
Dry dusts and powders	Fine rubber dust, Bakelite molding powder dust, jute lint, cotton dust, shavings (light), soap dust, leather shavings	3000–3500 fpm [15.24–17.78 m/s]
Average industrial dust	Grinding dust, buffing lint (dry), wool jute dust (shaker waste), coffee beans, shoe dust, granite dust, silica flour, general material handling, brick cutting, clay dust, foundry (general), limestone dust, packaging and weighing asbestos dust in textile industries	3500–4000 fpm [17.78–20.32 m/s]
Heavy dusts	Sawdust (heavy and wet), metal turnings, foundry tumbling barrels and shake-out, sand blast dust, wood blocks, hog waste, brass turnings, cast iron boring dust, lead dust	4000–4500 fpm [20.32–22.86 m/s]
Heavy or moist dusts	Lead dusts with small chips, moist cement dust, buffing lint (sticky), quick-lime dust	4500 fpm [22.86 m/s] and up

Table 5-1: From American Conference of Governmental Industrial Hygienists (ACGIH®), Industrial Ventilation: A Manual of Recommended Practice, 29th Edition. Copyright 2016. Reprinted with permission.

Section 2203.3.2 Plastic Ducts and Conveying Systems. Item 1. Manufactured of static dissipative construction.

Static dissipative hoses are required for c dusts with a Minimum Ignition Energy up to 2000 mJ due to the risk of propagating brush discharges. If the c dust MIE is for example 2000 mJ then static dissipative or conductive hose is not required or needed as there is no risk of static ignition. See Britton, Avoiding Static Ignition Hazards in Chemical Operations for additional information. This requirement is overly restrictive as a result.

Section 2303.3.2 Item 3. Limited to 18 inches (457 mm) in length.

There is no requirement in NFPA 77, NFPA 499, NFPA 652, NFPA 654, NFPA 664 that limits the length of flexible conductive hose to 18 inches. It is limited to NFPA 61 for Agricultural and Food Processing Facilities for duct systems. NFPA 61 points to NFPA 654 for pneumatic conveying systems. The authors have combined two distinct systems into one set of requirements inappropriately and in doing so created another conflict in the application of the referenced standards. This is an onerous restriction without a technical basis. The wood products industry use several pieces of equipment that require the use of longer flexible hoses 8-10 feet in length in some cases for flying saws. There is no basis for limiting length if the hose material is conductive with flexible wire inside hose attached to metal on end(s) for bonding and grounding with a resistance of less than 1 million ohms.

Section 2203.3.3 Cleanouts.

This section requires openings in **enclosed equipment and conveyors to allow access to all parts of the equipment and conveyors to permit inspection, cleaning, maintenance, and the effective use of portable extinguishers or hose streams**. Providing access to all enclosed parts of equipment and conveyors is neither practical nor useful. Further, though the authors point to the IMC in the second sentence, they ignore the fact that fire protection for hazardous exhaust systems is covered by the Section 510.8 of the IMC and Duct Cleanouts are covered by Section 510.8.1 of the IMC. Since the proposed language does not match the existing IMC sections, the proposal causes a conflict with the requirements of the IMC.

Section 2203.4.1 Hazardous Area Classification.

This section refers to Classified area classification, the correct terminology from the NEC (NFPA 70) is Hazardous (Classified) Areas. As written the proposed language has a disconnect with the terms of the NEC. The section then goes on to require compliance with Sections 500-506 of NFPA 70. Since this language would apply to combustible dusts, in Chapter 5 of the NEC a combustible dust electrical hazard would be a Class II Location covered by Article 502, Article 504, and Article 506, and Article 506 Zone 20, 21 and 22 Locations for Combustible Dusts or Ignitable Fibers/Flyings. Articles 501, 503 and 506 Zone 0, 1 and 2 Locations would not apply. The NEC reference in the proposed language is incorrect and partially unenforceable. Further, in identifying electrical equipment to listed the language refers to the dust laden air stream. Air stream is not defined, more importantly, that phrase has no relation to the conditions identified in NFPA 70, Article 500, Section (C) Class II Locations, including Subsection (1) Class II, Division 1 and Subsection (2) Class II, Division 2. There is a complete disconnect with the applicable language in the NEC and as written would likely not provide for the appropriate level of protection. This will be misleading to code officials and the regulated facilities.

Section 2203.4.3.1 Signs.

In Pulp and Paper and Wood Processing facilities and chemical facilities this will require dozens of signs, if a hundred or more signs at some facilities. Welding may be needed for repairs anytime where dust handling, generation or storage equipment is present. Safe Work and Hot Work Permits in accordance with Chapter 35 of the IFC addresses the hazards and risks of welding in combustible dust areas. This onerous and costly requirement is not necessary.

Section 2203.4.4 Hot Surfaces and Hot Equipment.

This section has requirements for worst-case dusts. There is no definition of this phrase. As such there is no way for the code official to understand how to apply the phrase and connected requirements and no way for a regulated facility to know what is required for compliance, leaving the language as unenforceable.

Section 2203.4.6 Smoking Prohibited.

Prescribing No Smoking signs in all industrial facilities in or adjacent to dust producing or dust handling areas is overly prescriptive and costly, since many facilities ban smoking completely throughout the facility. This is an onerous requirement. Section 310 would not require all these locations to be posted if the building was posted as No Smoking.

Section 2204.1 Combustibility and Explosivity Tests.

This section refers to when such tests are required by Section 414.1.3 of the IBC and Section 104.7 of the IFC. Neither of those sections requires such tests or provide any guidance on when they should be conducted. Further, Section 414.1.3 of the IBC only applies when a new occupancy is proposed and only to hazardous materials. Combustible dust is not a hazardous material by definition. The language then points directly to Section 5.4 of NFPA 52 which then instructs that the

tests be conducted in accordance with Section 5.5 of that chapter which addresses a sampling plan. (Which means Section 2204.2 simply repeats what Section 5.4 of NFPA 652 tells you to do already.) There is no guidance on when or where such actions are to be taken because the authors have by-passed correct application of NFPA 652. Chapter 5 of NFPA 652 applies Hazard Identification for characterizing properties of combustible dusts as required to support a Dust Hazard Analysis (DHA). Chapter 7 of NFPA 652 addresses Dust Hazard Analysis, but the language does not point the code user to that fact. Based upon Chapter 4 and Chapter 7 of NFPA 652, all new and existing facilities with a potential combustible dust hazard must perform a DHA. The current IFC language provides clear guidance on that topic, this new language does not. As proposed there is no trigger for the information to be submitted in this proposed language.

Section 2205.1 Specific Hazard Standards.

The language in the current code makes it clear that the appropriate referenced standards must be complied with which is the responsibility of the owner or operator. The proposed new language changes that mandate of compliance to The fire code official is authorized. The fire code official is always authorized to apply any part of the fire code, that is covered by Chapter 1. This is a significant change in that now the needed standards will only apply if the fire code official determines they are necessary as compared to the current language that mandates compliance by the facility regardless of action taken by the fire code official. The new language of this entire proposal does not provide enough requirements for a safe facility, the referenced standards must be applied and the language needs to reflect that. This section and Section 2204.1 are fatal flaws for the proposal because they take away the certainty of applying NFPA 652 and the other referenced standards necessary for safe facilities. The Chemical Safety Board expects NFPA 652 and any appropriate standard to be applied in total, as does OSHA and the NFPA 1 Fire Code. The current 2018 edition of the IFC meets those expectations because they are necessary. This proposal returns the IFC to earlier years when thorough compliance was not clearly required.

The relevant NFPA standards properly cover the combustible dust hazard through requirements developed by a broad range of interested parties including enforcers and the regulated industry. The current IFC language correctly ties the fire code to those standards including when and how to apply them. Because of this and the technical problems noted above, the F212-18 proposal should be disapproved.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

As written, the proposal can increase the cost of compliance because of the conflicts with the currently referenced standards and with the International Mechanical Code. Ambiguity with the application of the referenced standards can also cause an increase in compliance. By disapproving the proposal the conflicts and ambiguity will be eliminated.

Public Comment 5:

Proponent: David Tyree, American Wood Council, representing American Wood Council (dtyree@awc.org) requests Disapprove.

Commenter's Reason: The International Fire Code (IFC), in Section 2204, has long recognized the validity of NFPA standards through incorporation by reference. In light of the history of work in this area by NFPA, we are concerned that F212-18 would unnecessarily introduce a new set of recommendations into a space that has been fully occupied by NFPA for decades. This creates the risk of inconsistencies between the various standards, leaving fire code officials and affected facilities with less clarity regarding the appropriate standard of care that should be exercised when addressing combustible dust hazards.

Based on our review of the proposal, there are numerous instances in which the proposal fails to appreciate and account for pre-existing NFPA recommendations as well as the practical implementation of combustible dust controls by fire code officials. For these reasons, we have significant concerns with any proposal to greatly expand the scope of IFC Chapter 22 in a manner that does not carefully track NFPA standards and, therefore, urge that F212-18 be disapproved. The International Fire Code (IFC), in Section 2204, has long recognized the validity of NFPA standards through incorporation by reference. In light of the history of work in this area by NFPA, we are concerned that F212-18 would unnecessarily introduce a new set of recommendations into a space that has been fully (and competently) occupied by NFPA for decades. This creates the risk of inconsistencies between the various standards, leaving fire code officials and affected facilities with less clarity regarding the appropriate standard of care that should be exercised when addressing combustible dust hazards.

Our reasons for disapproval by section are as follows:

Section 2203.1 - *The current edition has not been listed, subsequent NFPA 654 and 664 editions will likely have different paragraph numbers than the current edition due to revisions to the edition.*

Section 2203.2 - *FM or UL does not approve the above-noted equipment. There is no listing agency that approves the equipment. This requirement would therefore not be valid and should be removed from the Section.*

Section 2203.2.1.2 - *This is an onerous requirement. In Pulp and Paper and Wood Processing facilities and chemical*

facilities this will require tens if of signs if not up to a hundred signs at some facilities. It is more practical to label each building or enclosure entrance (e.g. wood conveyor tunnel) where combustible dust handling or generating equipment is present with a sign stating for example: Warning: Combustible Dust Hazard Area. Avoid Dispersion of Dust . OR , Warning: Combustible Dust Hazard Area: Follow Safe Work Practices.

The existing text brings up the question of defines marked areas. Is this a hazard zone? There is no defined basis for the delineation of the marked area . NFPA 68 has requirements for establishing a hazard or exclusion zone around vented dust collectors based on the dust Kst and volume of the collector but no other requirements for a marked area exists in NFPA combustible dust documents.

Section 2203.2.1.3 - NFPA 68 Standard on Explosion Protection by Deflagration Venting (2018 Edition) requires a warning sign near vents in paragraph 11.3.4* Vent closures shall be clearly marked as follows:

WARNING: Explosion relief device

Stay clear is not a requirement. This is another example of a discrepancy in the NFPA and the IFCC recommended requirement. If a facility meets the NFPA 68 warning sign requirement it will not meet the specific IFCC venting signage requirement.

Section 2203.3.1.2 - What is the reference for these conveying velocities. The American Conference of Governmental Hygienists Industrial Ventilation Manual (considered the gold standard for industrial ventilation across the US and globe recommends the table inserted). NFPA combustible dust standards have incorporated by reference the ACGIH duct velocity recommendations.

Section 2203.3.2 - Static dissipative hoses are required for c dusts with a Minimum Ignition Energy up to 2000 mJ due to the risk of propagating brush discharges. If the c dust MIE is for example 2000 mJ then static dissipative or conductive hose is not required or needed as there is no risk of static ignition. See Britton, Avoiding Static Ignition Hazards in Chemical Operations for additional information. There additionally is no basis provided for the hose length restriction in NFPA 652, 654 or 664 standards.

The wood processing industry uses large saws (e.g. flying saws) that move across long section of OSB and plywood that is equipped with 6-10 feet of flexible hose connected to a dust collection system. This would prohibit or limit the use of this equipment and restrict the use of similar dust collection ductwork required for this type equipment.

Section 2203.4.3.1 - As noted earlier in this reason statement, this is a very onerous signage requirement. In Pulp and Paper and Wood Processing facilities and chemical facilities this will require tens of signs if not up to a hundred signs at some facilities. Welding may be needed for repairs anytime c dust handling, generation or storage equipment is present. Safe Work and Hot Work Permits address the hazards and risks of welding in combustible dust areas.

Section 2303.4.4 - What is the definition of worst-case dusts ? It is inappropriate to have a requirement with a nebulous, undefined term.

Section 2203.4.6 - What is the basis for this requirement? Most saws are spark production devices and are allowed in hazardous classified locations. Also classified electrical is an incomplete phrase and is ambiguous? The correct term is hazardous area classification or hazardous area classified equipment.

Section 2203.5 - Compressed air can be used for housecleaning following NFPA 652, 654 and 664.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no increase.

F212-18

F226-18

IFC: 2311.8

Proposed Change as Submitted

Proponent: Spencer Quong, representing Toyota Motor North America (squong@yahoo.com); Robert Davidson, Davidson Code Concepts, LLC, representing Toyota, USA (RJD@davidsoncodeconcepts.com)

2018 International Fire Code

Revise as follows

2311.8 Repair garages for vehicles fueled by lighter-than-air fuels. The room, motor vehicle repair booth or motor vehicle repair space containing repair garage activities for the conversion or repair of vehicles that use CNG, LNG, hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.8 through 2311.8.11 in addition to the other requirements of Section 2311. Repair garages for the repair of vehicles that use hydrogen fuel shall be in accordance with this code and NFPA 2.

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 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 (1724 kPa at 21°C).
5. Where approved by the fire code official, repair garages for hydrogen-fueled vehicles where an analysis has been submitted documenting that a flammable mixture in air will not occur in the room or space if the hydrogen is released from the motor fuel tank.

Reason: The purpose of this proposal is to eliminate the extra protection features for hydrogen motor vehicle repair garages in those cases where an analysis has been performed and submitted documenting that flammable mixture of the hydrogen and air will not occur if the hydrogen is released from its tank.

The application of this exception would be conditioned upon the approval of the fire code official since the necessary analysis, including computer modeling, would be facility specific including the dimensions of the room or space.

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

This change would decrease the cost of construction in those cases where the application of the analysis exception is approved.

F226-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved with concern that even with analysis the flammable mixture may be to high. The committee would like to see more details on what the analysis includes or possibly a standard that addresses this allowance. (Vote: 13-1)

Assembly Action:

None

F226-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Toyota, USA (rjd@davidsoncodeconcepts.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

2311.8 Repair garages for vehicles fueled by lighter-than-air fuels. The room, motor vehicle repair booth or motor vehicle repair space containing repair garage activities for the conversion or repair of vehicles that use CNG, LNG, hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.8 through 2311.8.11 in addition to the other requirements of Section 2311. Repair garages for the repair of vehicles that use hydrogen fuel shall be in accordance with this code and NFPA 2.

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 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~~ 70 F (1724 kPa at ~~21°C~~ 21 C).
5. Where approved by the fire code official, repair garages for hydrogen-fueled vehicles where an analysis has been submitted documenting that a flammable mixture in air ignition hazard will not occur in the room or space if the hydrogen is released from the motor fuel tank. The analysis shall be in accordance with Section 104.9 of this code. The analysis shall include the following:
 - 5.1. The location of the hydrogen release within the room or space.
 - 5.2. The modeled plume from the leak source to dissipation or exhaust, and shall include the plume concentrations with a detailed explanation of why an ignition would not occur at any point where the concentration is at or above the lower explosive limit (LEL) for hydrogen.

Commenter's Reason: To address the committee concerns the proposal has been modified to identify that the intent is to document that an ignition hazard will not occur, that the submittal must be in accordance with Section 104.9 "Alternative materials, design and methods of construction and equipment" and identifying core information that must be included in the analysis.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction This change would decrease the cost of construction in those cases where the application of the analysis exception is approved.

F229-18

IFC: 2404.3.4

Proposed Change as Submitted

Proponent: Geoffrey Raifsnider, Global Finishing Solutions, representing Self

2018 International Fire Code

Add new text as follows

2404.3.4 Limited Finishing Workstations. A limited finishing workstation shall comply with the applicable provisions of NFPA 33 and Sections 2404.4 through 2404.8.2.

Reason: This proposed addition addresses a common type of spray application enclosure used in the finishing industry that is not currently addressed by the code. NFPA 33 includes definitions and the minimum safety requirements for this type of equipment.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. There is no cost impact due to this change. Equipment is currently built to meet the requirements of NFPA 33.

F229-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as it conflicts with limited spray area concept. When limited spray area provisions were reviewed the issue of limited finishing workstations was incorporated into that concept. (Vote: 14-0)

Assembly Action:

None

F229-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Geoffrey Raifsnider, representing Self (graifsnider@globalfinishing.com) requests As Submitted.

Commenter's Reason: The committee indicated that this proposal was disapproved as it conflicts with limited spray area concept. They indicated that when previously reviewed the issue of limited finishing workstations were incorporated. However, the current language addresses limited spraying spaces and not enclosed spray finishing. The language in this section is consistent with open spraying as indicated by the electrical wiring section. It also limits the surface area that can be painted

The proposal as originally submitted addresses an enclosed finishing booth which is common in the industry and is not currently addressed by the code. NFPA 33 includes definitions and the minimum safety requirements for this type of equipment.

This proposal does not change the requirements of open spraying covered by section 2404.9 Limited spraying spaces.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no cost impact due to this change. Equipment is currently built to meet the requirements of NFPA 33.

F229-18

F243-18

IFC: 3104.2, 3104.3, 3104.4

Proposed Change as Submitted

Proponent: Thomas Markel, representing Industrial Fabrics Association International - Tent Rental Division; Paul Armstrong, representing IFAI (paul@paulandvauna.com)

2018 International Fire Code

Revise as follows

3104.2 Flame propagation performance treatment. Before a permit is granted, the *owner* or agent shall file with the *fire code official* a certificate ~~executed~~ provided by the product manufacturer certifying the materials have been tested by an approved testing laboratory. The certificate shall indicate that the floor coverings, tents, membrane structures and their appurtenances, which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701, as applicable. Alternatively, the materials shall be treated with a flame retardant in an *approved* manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701. The flame propagation performance criteria shall be effective for the period specified by the permit.

3104.3 Label. Membrane structures or tents shall have a permanently affixed label bearing the identification of size and fabric or material ~~type in addition to information required in Section 3104.4 of this Chapter.~~

3104.4 Certification. An affidavit or affirmation shall be submitted to the fire code official and either a copy retained on the premises on which the tent or air-supported structure is located or label affixed to the tent or air supported structure. The affidavit shall attest to the names and address of the manufacturers of the tent or air-supported structure and either of the following information relative to the flame propagation performance criteria of the fabric:

- ~~1. Names and address of the manufacturers of the tent or air-supported structure.~~
- ~~2. Either with~~ The date the fabric was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name of person or firm treating the material and name of testing agency and test standard by which the fabric was tested, or
- 3: trade ~~Trade~~ name or kind of chemical used in ~~treatment.~~ treatment.
- 4: name ~~Name~~ of person or firm treating the ~~material.~~ material and
- 5: name ~~Name~~ of testing agency and test standard by which the fabric was ~~tested.~~ tested, or
2. The material meets NFPA 701 test Method 1 or 2 without treatment.

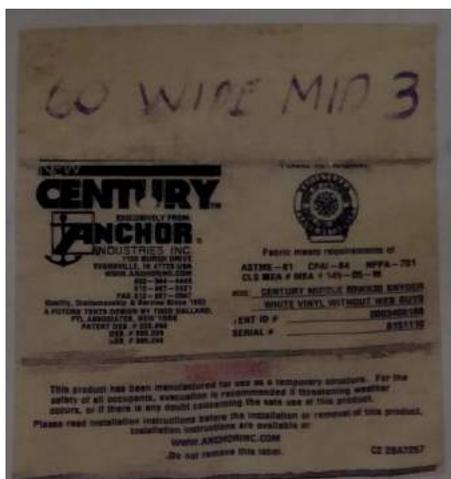
Reason: Tents and membrane structures have been labeled and certifications provided for decades since the Hartford circus fire. At the time of the fire tent material was a natural fiber and waterproofing was accomplished with a flammable mixture. After the fire a external flame retardant was required to be applied to retard flame spread. The topical application was subject to weather and cleaning and would degrade over time and exposure. Retreatment and retesting was needed for compliance.

With the availability of polyester or PVC based material, that has flame retardant integrated into the raw material before extrusion, external treatment of material is not required. The flame retardant is capable of performing for the life of the material and cannot be washed or weathered away. Also, "field testing" (NFPA 705) the tent or membrane structure by cutting out sections for testing, damages the membrane and degrades the structural integrity of the material increasing the danger to the public for a structural failure.

This code proposal changes three parts of the flame propagation requirement that are interrelated.

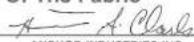
Flame propagation (3104.2): Testing agencies have never issue the label or certification of the assembled product, rather they test and document the materials used in assembly. The affixed label and certification provided for permitting have ***always*** been provided by the manufacturer (see attachments). This change to flame propagation corrects the code to what has been the acceptable practice for generations. Further it would be impossible and impractical to enforce the current code; for testing agencies are not capable of producing the label and certification documentation for every tent and sidewall produced by a manufacturer, nor are they able to trace the chain of custody of the materials as the manufacturer's have been doing as evident in both the certifications and labels (see attachments). Therefore this change only brings the code in line with what has been acceptable practice.

Labeling (3104.3): The code is very general and viewing the attached labels, the information presented varies widely. By tying the information required for the label to "match" the certification documentation aids the fire code official to insure the installation matches the permit documents.



Certification (3104.4): This change brings the code requirements of documentation up-to-date with modern tent and membrane structure manufacturing. Rarely is a natural fiber used in new product manufacturing. However, use of older tents made from natural fibers still occurs. The change in certification reflects the modern use of polyester and PVC material (new #3) whose flame retardant is now integrated in the raw polyester or PVC before extruded into material, and therefore cannot be washed or weathered away as the topical application method used on natural fibers.

IMPORTANT DOCUMENT		
Certificate of Flame Resistance		
REGISTRATION APPLICATION NUMBER P140.1	ISSUED BY  EVANSVILLE, INDIANA 47725 MANUFACTURERS OF THE FINISHED TENT PRODUCTS DESCRIBED HEREIN	Date of Manufacture 03/01 Order Number 0000
<p>This is to certify that the material(s) described have been flame-retardant treated (or are inherently nonflammable) and were supplied to:</p> <p>7204 BRAVO EVENTS - THE FLORISTRY 1385 OSLAWAY AVENUE BUFFALO NY 14209</p>		
<p>Certification is hereby made that: The articles described on this Certificate have been treated with a flame-retardant approved chemical and that the application of said chemical was done in conformance with California Fire Marshal Code, equal to exceeds NFPA 701, CPAI 84, ULC 109. The method of the FR chemical application is:</p> <p>Serial # _____ Description of item certified: DULAKO 000-PP-8-10-10</p>		
<p align="center">Flame Retardant Process Used Will Not Be Removed By Washing And Is Effective For The Life Of The Fabric</p>		
APPLIED BY JERRY SNYDER, EVANSVILLE, IN	Signed: 	TEST OPERATOR - ANCHOR INDUSTRIES INC.

IMPORTANT DOCUMENT		
Certificate of Flame Resistance		
REGISTRATION APPLICATION NUMBER P140.1	ISSUED BY  EVANSVILLE, INDIANA 47725 MANUFACTURERS OF THE FINISHED TENT PRODUCTS DESCRIBED HEREIN	Date of Shipment 5/5/2006 Tent Identification 04237496
<p>This is to certify that the materials described have been flame-retardant treated (or are inherently nonflammable) and were supplied to:</p> <p>72654 FANTHER CREATIONS LTD DBA BRAVO EVENTS - THE FLORIST 71 PARK ST BUFFALO NY 14201</p>		
<p>Certification is hereby made that: The articles described on this Certificate have been treated with a flame-retardant approved chemical and that the application of said chemical was done in conformance with California Fire Marshal Code. All fabric has been tested and passes NFPA 701-99, CPAI 84, ULC 109.</p> <p>Serial # 8151210 (1) Description of item certified: CENTURY END 60WX20 HOLE SNYDER WHITE VINYL WITHOUT WEB GUYS</p>		
<p align="center">Flame Retardant Process Used Will Not Be Removed By Washing And Is Effective For The Life Of The Fabric</p>		
APPLIED BY SNYDER MEG-NEW PHILADELPHIA OH Name of Applicator of Flame Resistant Finish	Signed: 	ANCHOR INDUSTRIES INC.

IMPORTANT DOCUMENT
Certificate of Flame Resistance

ISSUED BY



Date of Shipment
05/20/11

Registration Number
F140.1

Tent Identification
14950431

EVANSVILLE, INDIANA 47725

MANUFACTURERS OF THE FINISHED TENT PRODUCTS DESCRIBED HEREIN

This is to certify that the materials described have been flame-retardant treated (or are inherently nonflammable) and were supplied to:

BRAVO EVENTS THE FLORISTRY
DBA BRAVO EVENTS - THE FLORISTRY
71 PARK ST
BUFFALO, NY 14201



Certification is hereby made that:

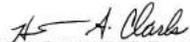
The articles described on this Certificate have been treated with a flame-retardant approved chemical and that the application of said chemical was done in conformance with California Fire Marshall Code. All fabric has been tested and passes NFPA 701-04, ULC 109.

Serial #
8152310 (1)

Description of item certified:
CENTURY END 80WX20 LOOP SNYDER
WHITE VL W/O WEB GUYS 10'SP

**Flame Retardant Process Used Will Not Be Removed By
Washing And Is Effective For The Life Of The Fabric**

SNYDER MFG NEW PHILADELPHIA, OH
Name of Applicator of Flame Resistant Finish

Signed: 
ANCHOR INDUSTRIES INC

Certificate of Flame Resistance

PAGE: 1

Date Manufactured

05/31/2011

AZTEC TENTS
 2665 COLUMBIA ST
 TORRANCE, CA 90503
 (800) 228-3687

INV NUMBER: 0186290
 P.O. NUMBER:
 CUSTOMER NO: BRAVO14

This is to certify that the materials described below have been flame retardant treated (or are inherently flame retardant).

BRAVO EVENTS
 71 PARK STREET
 Buffalo, NY 14210

Vendor	Trade Name	UL Code #
Shun	Hardi Gra	F-322.04
Shun	Shun	F-322.04
California Comp.	Lam-Tex 12, 14, 16, 18oz	F-413.01
Colord Fabrics	Clear vinyl 30ga / 30ga	F-510.02
Colr	Clear vinyl 10ga / 30ga	F-510.02
DAF	DAF	F-553.02
Exclusivity Edge	PolySateen Liner	F-434.01
Famen	Emciment 502	F-444.01
Famen	Emciment 702	F-444.02
George Textiles	Geo-Polycor	F-500.01
Pro-Tech	Geo Cloth / Weave	F-504.01
Shyler	Weatherspan	F-140.01
Ti Vantage	Procoat Sunbrella	F-368.05
Ti Vantage	Proco 500	F-121.02
Ti Vantage	Big Top	F-121.10
Ti Vantage	Original Weather	F-505.01
Ti Vantage	Aviclon / Coasione	F-065.01
Verselag	Corexam 81673, 81515	F-530.01

Certification is hereby made that the articles described below hereof are made from a flame-retardant fabric or material registered and approved by the California State Fire Marshal for such use. The fabric has been tested and passes NFPA 701 Large Scale. See chart to right for trade name of flame-resistant fabric or material used and additionally referenced on the label of the fabric panel.

THE FLAME RETARDANT PROCESS USED WILL NOT BE REMOVED BY WASHING

David Bradley

Name of Applicator or Production Superintendent

General Manager- Manufacturing

Title of Applicator or Production Superintendent

ITEMS MANUFACTURED	TYPE	PRODUCED
30x30 2pc Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on both Ends	S	1
30x15 Mid Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on Both Ends	S	2
30x10 Mid Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on Both Ends	S	1
40x40 2pc Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on Both Ends	S	1
40x20 Mid Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on Both Ends	S	4
40x10 Mid Jumbotrac Top UW ***Double Valance ***Ratchet Tensioners w/ S-Hook on Both Ends	S	1
Mid-Span Tensioner *** (12) for 30x *** (16) for 40x	S	28

Certificate of Flame Resistance



ISSUED BY
Snyder Manufacturing, Inc.
 3001 Progress Street
 Dover, OH 44622

Manufactured by
Fred's Tents & Canopies
 7 Tent Lane
 Stillwater, NY 12170

Date treated or
 manufactured

03/07

This is to certify that the materials described below have been flame-retardant treated (or are inherently nonflammable)

FOR

Bravo Events Expos Displays
71 Park Street
Buffalo, NY 14201

Certification is hereby made that: (Check "a" or "b")

a) The articles described below this Certificate have been treated with a flame-retardant chemical approved and registered by the State Fire Marshal and that the application of said chemical was done in conformance with the laws of the State of California and the Rules and Regulations of the State Fire Marshal.

Name of chemical used _____ Chem. Reg. No. _____

Method of application _____

(b) The articles described below are made from a flame-resistant fabric or material registered and approved by the State Fire Marshal for such use.

NFPA-701 (large scale)

Trade name of flame-resistant fabric or material used Blockout White 1610

Reg. No. 140.01

The Flame-Retardant Process Used WILL NOT Be Removed By Washing

Fred's Studio Tents & Canopies, Inc.

Plant Supervisor

Product Description 40x100 Series SE Pole Tent Customer Invoice # 17713

Cost Impact: The code change proposal will not increase or decrease the cost of construction No additional cost.

F243-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 3104.2 Flame propagation performance treatment. Before a permit is granted, the owner or agent shall file with the fire code official a certificate ~~executed~~provided by the product manufacturer certifying the materials have been tested by an approved testing laboratory. The certificate shall indicate that the floor coverings, tents, membrane structures and their appurtenances, which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701, as applicable. Alternatively, the materials shall be treated with a flame retardant in an approved manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701. The flame propagation performance criteria shall be effective for the period specified by the permit.

3104.4 Certification. An affidavit or affirmation shall be submitted to the fire code official and either a copy retained on the premises on which the tent or air-supported structure is located or label affixed to the tent or air supported structure. The affidavit shall attest to the names and address of the manufacturers of the tent or air-supported structure and either of the following information relative to the flame propagation performance criteria of the fabric:

~~1. Names and address of the manufacturers of the tent or air-supported structure.~~

~~1.2. Either with t~~The date the fabric was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name of person or firm treating the material and name of testing agency and test standard by which the fabric was tested, or

~~2.3. The material meets NFPA 701 test Method 1 or 2 without treatment.~~

Committee Reason: Approval of the modification is based on the improvement of the language to match the intent of the requirements. Approval of the proposal is based upon the proponent's published reason and that it provides specific guidance on older and newer tents. (Vote: 10-4)

Assembly Action:

None

F243-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Tim Earl, representing GBH International (tearl@gbhinternational.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

3104.3 Label. Membrane structures or tents shall have a permanently affixed label bearing the following information:

- ~~1. The identification of size and fabric or material.~~
- ~~2. The names and addresses of the manufacturers of the tent or air-supported structure.~~
- ~~3. Statement that the fabric or material in addition to information required in meets the requirements of Section 3104.2.~~
- ~~4. If treated, the date the fabric or material was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name or person or firm treating the fabric or material, and name of testing agency and test standard by which the fabric or material was tested.~~
- ~~5. If not treated, statement that no treatment was applied when the fabric or material met the requirements of Section 3104.2 of this Chapter.~~

~~**3104.4 Certification Affidavit.** An affidavit or affirmation shall be submitted to the fire code official and either a copy retained on the premises on which the tent or air-supported structure is located or label affixed to the tent or air supported structure. The affidavit shall attest to the names and address of the manufacturers of the tent or air-supported structure and either of the following information relative to the flame propagation performance criteria of the fabric: The affidavit required by Section 3104.2 shall contain all of the information specified in Section 3104.3.~~

- 1- ~~The date the fabric was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name of person or firm treating the material and name of testing agency and test standard by which the fabric was tested, or trade name or kind of chemical used in treatment, name of person or firm treating the material and name of testing agency and test standard by which the fabric was tested, or~~
- 2- ~~The material meets NFPA 701 test Method 1 or 2 without treatment~~

Commenter's Reason: This Public Comment cleans up the requirements regarding the required affidavit and label. The intent of the original proposal is preserved, but the Public Comment lists in a more straightforward fashion the information which the affidavit and label must contain.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no additional cost as this is currently what the industry is doing.

Public Comment 2:

Proponent: Marcelo Hirschler, GBH International, representing GBH International (mmh@gbhint.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

3104.3 Label. Membrane structures or tents shall have a permanently affixed label bearing the identification of size and fabric or material in addition to information required in Section 3104.4 of this Chapter.

3104.4 Certification Affidavit. An affidavit ~~or affirmation~~ shall be submitted to the fire code official and ~~either a copy retained on the premises on which the tent or air-supported structure is located or label affixed to the tent or air-supported structure.~~ The affidavit shall attest to the names and address of ~~the manufacturers~~ the manufacturers of the tent or air-supported structure ~~and either of the following information relative to the flame propagation performance criteria of the fabric:~~ a statement that the fabric or material met the requirements of Section 3104.2 and one of the following:

1. ~~The date~~ if the fabric or material was treated, the date that it was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name of person or firm treating the material and the name of testing agency and test standard by which the fabric or material was tested, ~~or trade name or kind of chemical used in treatment, name of person or firm treating the material and name of testing agency and test standard by which the fabric was tested, or~~ The material meets NFPA 701 test Method 1 or 2 without treatment.
2. If the fabric or material was not treated, a statement that the fabric or material met the requirements of Section 3104.2 without treatment.

Commenter's Reason: This public comment does the following:

1. It makes no changes to 3104.3, which requires that the label contain all the information in 3104.4.
2. It eliminates the contradictory requirement in 3104.4 that there be either an affidavit or a label. There must be both, as made clear by 3104.3. This does not change the requirements but cleans up a contradiction.
3. It retains all the information required by the proposal but also adds that the affidavit (and the label) must confirm not just that the fabric or material was tested but that it passed the appropriate test, as required by 3104.2. Note that passing NFPA 701 method 1 does not ensure passing NFPA 701 method 2.
4. This public comment does not address 3104.2, which is addressed by an alternate public comment.

The final wording is difficult to read in cdpAccess and it is shown below.

3104.4 Affidavit. An affidavit shall be submitted to the fire code official and a copy retained on the premises on which the tent or air-supported structure is located. The affidavit shall attest to the names and address of the manufacturers of the tent or air-supported structure, a statement that the fabric or material met the requirements of Section 3104.2 and one of the following.

1. If the fabric or material was treated, the date that it was last treated with flame-retardant solution, the trade name or kind of chemical used in treatment, name of person or firm treating the material and the name of testing agency and test standard by which the fabric or material was tested.

2. If the fabric or material was not treated, a statement that the fabric or material met the requirements of Section 3104.2 without treatment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This public comment simply clarifies what is required in the label and the affidavit and clears an inconsistency in the code.

Public Comment 3:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

3104.2 Flame propagation performance treatment. Before a permit is granted, the *owner* or agent shall file with the *fire code official* a certificate provided by the product manufacturer ~~certifying to verify that~~ the materials have been tested ~~and certified~~ by an *approved* testing laboratory. The certificate shall indicate that the floor coverings, tents, membrane structures and their appurtenances, which include sidewalls, drops and tarpaulins, are composed of materials meeting the flame propagation performance of Test Method 2 of NFPA 701. Additionally, it shall indicate that the bunting and combustible decorative materials and effects are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2 of NFPA 701, as applicable. Alternatively, the materials shall be treated with a flame retardant in an *approved* manner and meet the flame propagation performance criteria of the applicable test method of NFPA 701. ~~The certificate shall indicate compliance with the testing requirements of Chapter 16 of NFPA 701.~~ The flame propagation performance criteria shall be effective for the period specified by the permit.

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>
This public comment incorporates into section 3104.2 the changes approved by the committee from proposal F242, which was submitted by FCAC. It also revises the statement of who is responsible for issuing the certificate of testing: the approved testing laboratory tests and certifies and the manufacturer provides the certification to the fire code official. Note that the term "provided" is the preferred term to "issued" as used in F242.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction
This is simply editorially combining the concepts in F242 and F243. Both proposals were approved by the committee.

F243-18

F245-18

IFC: 105.6, 202, 3101.1, SECTION 3106, 3106.1, 3106.2, 3106.3, 3106.4, 3106.5, 3106.6, 3106.7, 3106.8, 3106.9, 3106.10, 3106.10.1

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (FCAC@iccsafe.org)

2018 International Fire Code

Add new text as follows

105.6 Inflatable Amusement Device. Inflatable Amusement Device. The fire code official is authorized to require an operational permit to operate an inflatable amusement device.

Exception: Operation on private property for an event not open to the public.

Add new definition as follows

INFLATABLE AMUSEMENT DEVICE. A device made of flexible fabric or other combustible materials that is inflated by one or more air-blowers providing internal air pressure to maintain its shape. Such a device is designed for recreational activities that allow occupants to bounce, climb, slide, negotiate an obstacle course or participate in interactive play.

Revise as follows

3101.1 Scope. Tents, temporary special event structures 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 Sections 3104 and 3106 are applicable to temporary and permanent tents and membrane structures. The provisions of Section 3105 are applicable to temporary special event structures. The provisions of Section 3106 are applicable to inflatable amusement devices. The provisions of Section 3107 are applicable to outdoor assembly events. Other temporary structures shall comply with the International Building Code.

Add new text as follows

SECTION 3106 INFLATABLE AMUSEMENT DEVICES

3106.1 Scope. Inflatable amusement devices shall comply with Sections 3106.2 through 3106.10.1.

3106.2 General. Inflatable amusement devices shall be designed, anchored, operated and maintained in accordance with the manufacturer's instructions. A complete copy of the manufacturer's instructions shall be filed with the operational permit and, where required, available at the site of operation for review.

3106.3 Permit required. Where required by the fire code official, the operation of an inflatable amusement device shall require a permit as set forth in Section 105.6

3106.4 Use period. Inflatable amusement devices shall not be operated for a period of more than 14 consecutive days at a single location.

3106.5 Combustible materials. The fabrics, textiles, containment netting and combustible small mesh materials used in the construction of the inflatable amusement device shall meet the flame propagation criteria of Test Method 2 of NFPA 701.

3106.6 Operation. Inflatable amusement devices shall be operated within the environmental conditions specified in the manufacturer's installation and operating instructions for wind and weather. Operators shall be familiar with the weather and wind conditions that exceed manufacturer's operating limits for an inflatable amusement device. Operators shall evacuate and deflate the device and not resume operations until conditions are within the manufacturer's operating limits.

3106.7 Permanent safety label. Every inflatable amusement device shall display one or more permanent labels demonstrating compliance with the requirements in this section.

3106.8 Required operators. The minimum number of approved operators to safely supervise operation of the device, as required by the manufacturer's instructions for each inflatable amusement device, shall be present at all times when the inflatable amusement device is in use.

3106.9 Electrical equipment and wiring. Electrical equipment, blower motors and temporary wiring for electrical power or lighting shall comply with the applicable provisions of NFPA 70. Extension cords and flexible cords shall be listed and labeled in accordance with UL 817. Electrical equipment, blower-motors and wiring utilized outdoors shall be listed and labeled for outdoor use.

3106.10 Portable generators. Portable generators shall comply with the applicable provisions of NFPA 70 and with the portable generator requirements of this code.

3106.10.1 Portable fire extinguishers. Each generator shall be provided with an approved portable fire extinguisher complying with Section 906 and placed in an approved location.

Reason: This proposal has been prepared through discussions with code officials, industry representatives and other stakeholders. Past events were analyzed related to outdoor “bounce houses” that were uplifted by wind gusts while occupied thereby resulting in injury to children and/or adults that were trapped inside. These new code requirements are simple and intended to improve the authority of code officials to ensure public safety when inflatable amusement devices are used for public gatherings or events.

This proposal introduces basic safety requirements for inflatable amusement devices also known as “bounce houses”. There have been numerous reported incidents of accidents and injuries involving these devices caused by weather events such as sustained or wind gusts and/or improper set-up, anchorage or use where the “bounce house” is uplifted, carried away and/or overturned with children or adults inside.

Chapter Scoping section modified to reference proposed new section.

This new section adds an “optional” operational permit requirement intended to cover public events and excludes operation on private (residential) property.

This section adds basic fire and electrical safety requirements for the construction, placement and operation of portable inflatable amusement devices. The section addresses safety requirements for both outdoor and indoor use of these devices.

A definition for inflatable amusement devices is also included to correlate the type of devices covered by these new IFC code 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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

This proposal adds requirements for inflatable amusement devices. This use of these devices and the requirements proposed have no relation to building construction or building construction costs.

F245-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: The committee stated that they had issues with the proposal regarding indoor vs. outdoor uses, time period, fire extinguishers, and the location of portable generators. (Vote: 12-2)

Assembly Action:

None

F245-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

105.6 Inflatable Amusement Device. ~~Inflatable Amusement Device. The fire code official is authorized to require an operational permit.~~ An operational permit is required to operate an inflatable amusement device.

Exception: ~~Operation on private property for an event not open to the public.~~

INFLATABLE AMUSEMENT DEVICE. A device made of flexible fabric or other combustible materials that is inflated by one or more air-blowers providing internal air pressure to maintain its shape. Such a device is designed for recreational activities that allow occupants to bounce, climb, slide, negotiate an obstacle course or participate in interactive play.

3101.1 Scope. Tents, temporary special event structures 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 Sections 3104 and 3106 are applicable to temporary and permanent tents and membrane structures. The provisions of Section 3105 are applicable to temporary special event structures. The provisions of Section 3106 are applicable to inflatable amusement devices. The provisions of Section 3107 are applicable to outdoor assembly events. Other temporary structures shall comply with the International Building Code.

SECTION 3106 INFLATABLE AMUSEMENT DEVICES

3106.1 Scope. Inflatable amusement devices shall comply with Sections 3106.2 through 3106.10.1.

3106.2 General. Inflatable amusement devices shall be designed, anchored, operated and maintained in accordance with the manufacturer's instructions. A complete copy of the manufacturer's instructions shall be filed with the operational permit and, where required, available at the site of operation for review.

3106.3 Permit required. Where required by the fire code official, the operation of an inflatable amusement device shall require a permit as set forth in Section 105.6

3106.4 Use period. ~~Inflatable amusement devices shall not be operated for a period of more than 14 consecutive days at a single location.~~

3106.5 Combustible materials. The fabrics, textiles, containment netting and combustible small mesh materials used in the construction of the inflatable amusement device shall meet the flame propagation criteria of Test Method 2 of NFPA 701.

3106.6 Operation. Inflatable amusement devices shall be operated within the environmental conditions specified in the manufacturer's installation and operating instructions for wind and weather. Operators shall be familiar with the weather and wind conditions that exceed manufacturer's operating limits for an inflatable amusement device. Operators shall evacuate and deflate the device and not resume operations until conditions are within the manufacturer's operating limits.

3106.7 Permanent safety label. Every inflatable amusement device shall display one or more permanent labels

demonstrating compliance with the requirements in this section.

3106.8 Required operators. The minimum number of approved operators to safely supervise operation of the device, as required by the manufacturer's instructions for each inflatable amusement device, shall be present at all times when the inflatable amusement device is in use.

~~**3106.9 Electrical equipment and wiring.** Electrical equipment, blower motors and temporary wiring for electrical power or lighting shall comply with the applicable provisions of NFPA 70. Extension cords and flexible cords shall be listed and labeled in accordance with UL 817. Electrical equipment, blower motors and wiring utilized outdoors shall be listed and labeled for outdoor use.~~

~~**3106.10 Portable generators.** Portable generators shall comply with the applicable provisions of NFPA 70 and with the portable generator requirements of this code.~~

~~**3106.10.1 Portable fire extinguishers.** Each generator shall be provided with an approved portable fire extinguisher complying with Section 906 and placed in an approved location.~~

Commenter's Reason: 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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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:

<https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

This public comment introduces basic safety requirements for inflatable amusement devices also known as "bounce houses". There have been numerous reported incidents of accidents and injuries involving these devices caused by weather events such as sustained or wind gusts and/or improper set-up, anchorage or use where the "bounce house" is uplifted, carried away and/or overturned with children or adults inside.

Chapter Scoping section modified to reference proposed new section.

This new section adds an "optional" operational permit requirement intended to cover only outdoor assembly events (definition: **OUTDOOR ASSEMBLY EVENT.** An outdoor gathering of persons for any purpose). The changes to section **106.6 Permits** addresses concerns raised by the IFC Technical Committee.

The deletion of section **3106.4 Use period** in this Public Comment addresses concerns raised by the IFC Technical Committee.

This section adds basic safety requirements for the construction, placement and operation of portable inflatable amusement devices. The section addresses safety requirements for only outdoor use of these devices. Any indoor use would be governed by existing code requirements for interior finish/decorations, fire protection systems, egress, etc.

A definition for inflatable amusement devices is also included to correlate the type of devices covered by these new IFC code requirements.

The deletion of section **3106.9 Electrical equipment and wiring** in this Public Comment addresses concerns raised by the IFC Technical Committee. Electrical safety requirements are covered by IFC Chapter 6 and the NEC.

The deletion of section **3106.10 Portable generators** in this Public Comment addresses concerns raised by the IFC Technical Committee. Portable generator requirements are covered by IFC Chapter 6 and the NEC.

The deletion of section **3106.10.1 Portable Fire Extinguishers** in this Public Comment addresses concerns raised by the IFC Technical Committee. Portable fire extinguisher requirements are covered by IFC Section 906 and NFPA 10 (by reference).

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal adds requirements for inflatable amusement devices. This use of these devices and the requirements proposed have no relation to building construction or building construction costs.

F245-18

F254-18

IFC: 3205.4

Proposed Change as Submitted

Proponent: Mark Chubb, Telgian Corp., representing Telgian Corp. (mchubb@telgian.com)

2018 International Fire Code

Add new text as follows

3205.4 Aisle maintenance. When restocking is not being conducted, aisles shall be kept clear of storage, waste material and debris. Fire department access doors, aisles and *exit* doors shall not be obstructed. During restocking operations using manual stocking methods, a minimum unobstructed aisle width of 24 inches (610 mm) shall be maintained in 48-inch (1219 mm) or smaller aisles, and a minimum unobstructed aisle width of one-half of the required aisle width shall be maintained in aisles greater than 48 inches (1219 mm). During mechanical stocking operations, a minimum unobstructed aisle width of 44 inches (1118 mm) shall be maintained in accordance with Section 3206.10.

Exception: In high-piled combustible storage protected by automatic sprinkler systems designed and installed to deliver 0.60 gpm/sq ft over the most remote 2,000 sq ft and not less than 0.70 gpm/sq ft from the four most demanding sprinklers in accordance with 903.3.1.1, displays and wing stacks not exceeding 48-inches in height provided they do not obstruct or reduce the clear width of the aisle to less than 48-inches.

Reason: The proposed exception recognizes and incorporates language consistent with the provisions of NFPA 13--2016, 20.3.1(13), which represent the most prevalent fire protection design criteria for many big box retail facilities. Extensive large-scale fire testing demonstrates that such displays do not compromise the effectiveness of sprinkler systems to control or extinguish fires in high-piled combustible storage when sprinkler systems satisfy these criteria.

Bibliography: NFPA 13, Standard for the Installation of Sprinkler Systems, 2016 edition. Quincy, MA: National Fire Protection Association.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Although the proposed change will not increase or decrease the cost of construction, it will facilitate operations that increase retail revenue in facilities that satisfy the specified fire protection design criteria.

F254-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 3205.4 Aisle maintenance. When restocking is not being conducted, aisles shall be kept clear of storage, waste material and debris. Fire department access doors, aisles and exit doors shall not be obstructed. During restocking operations using manual stocking methods, a minimum unobstructed aisle width of 24 inches (610 mm) shall be maintained in 48-inch (1219 mm) or smaller aisles, and a minimum unobstructed aisle width of one-half of the required aisle width shall be maintained in aisles greater than 48 inches (1219 mm). During mechanical stocking operations, a minimum unobstructed aisle width of 44 inches (1118 mm) shall be maintained in accordance with Section 3206.10.

Exception: In high-piled ~~single- and double-row rack storage of combustible storage materials~~ protected by automatic sprinkler systems designed and installed ~~to deliver 0.60 gpm/sq ft over the most remote 2,000 sq ft and not less than 0.70 gpm/sq ft from the four most demanding sprinklers in accordance with 903.3.1.1, in accordance with the requirements of NFPA 13 governing the use of k=25.2 (360) sprinklers,~~ displays and wing stacks not exceeding 48-inches in height provided they do not obstruct or reduce the clear width of the aisle to less than 48-inches...

Committee Reason: Approval of the modification is based on the improvement of the language to elaborate that it applies to both single and double row racks and is tied to the performance of the type of fire sprinkler that is being used.. Approval of the proposal is based upon the proponent's published reason and that the addition of the exception provides a method by which the actual use of a aisle can be addressed by a heightened fire sprinkler system design. (Vote: 12-1)

Assembly Action:

None

F254-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Kevin Scott, representing KH Scott and Associates LLC. (khscottassoc@gmail.com) ; Ellie Klausbruckner, representing Klausbruckner and Associates (ek@klausbruckner.com) ; Mark Chubb, representing Telgian Corp. (mchubb@telgian.com) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

3205.4 Aisle maintenance. When restocking is not being conducted, aisles shall be kept clear of storage, waste material and debris. Fire department access doors, aisles and *exit* doors shall not be obstructed. During restocking operations using manual stocking methods, a minimum unobstructed aisle width of 24 inches (610 mm) shall be maintained in 48-inch (1219 mm) or smaller aisles, and a minimum unobstructed aisle width of one-half of the required aisle width shall be maintained in aisles greater than 48 inches (1219 mm). During mechanical stocking operations, a minimum unobstructed aisle width of 44 inches (1118 mm) shall be maintained in accordance with Section 3206.10.

Exception: ~~In high-piled single- and double-row rack storage of combustible materials protected by automatic sprinkler systems designed and installed in accordance with the requirements of NFPA 13 governing the use of k=25.2 (360) sprinklers, displays and wing stacks not exceeding 48-inches in height provided they do not obstruct or~~

Displays and wing stacks shall be permitted in aisles provided the following conditions are met:

1. The storage area consists of single-row or double-row racks.
2. The displays and wing stacks are less than 48 inches (1219 mm) in height.
3. The displays and wing stacks do not reduce the clear width of the aisle to less than 48-inches (1219 mm).
4. The storage area is protected by an automatic sprinkler system in accordance with NFPA 13 utilizing extended coverage sprinklers with a nominal K-factor of K=25.2 (360).

Commenter's Reason: This item was Approved as Modified by the committee. This Public Comment accomplishes two goals. 1) The new text becomes a 2nd paragraph rather than an exception. The section already specifies when the aisle width can be reduced for functions such as restocking. So it is not really an exception, it is another situation where the reduced aisle width is allowed.

2) The revision clarifies the requirements based on the design criteria in NFPA 13.

This situation occurs routinely in big box retail facilities. This revision provides the criteria the inspector needs to allow the operation to continue. When the criteria is met, testing has confirmed that the impact is negligible and can be allowed without a negative impact on the fire sprinkler protection.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction. This is an operational function in these retail facilities. It will not affect construction, but it will allow these displays to occur safely.

F254-18

F262-18 Part I

IFC: Chapter 33

Proposed Change as Submitted

Proponent: Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IBC-G COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Fire Code

CHAPTER 33 FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION

SECTION 3301 GENERAL

3301.1 Scope. This chapter shall apply to structures in the course of construction, *alteration* or demolition, including those in underground locations. ~~Compliance with NFPA 241 is required for items not specifically addressed herein.~~

3301.2 Purpose. This chapter prescribes minimum safeguards for construction, *alteration* and demolition operations to provide reasonable safety to life and property from fire during such operations.

3302 REQUIREMENTS

3302.1 Requirements. Fire safety during construction and demolition shall be in accordance with Chapter 33 of the International Building Code. Compliance with NFPA 241 is required for items not specifically addressed therein.

~~Delete without substitution~~

~~SECTION 3302-DEFINITIONS~~

~~SECTION 3303 TEMPORARY HEATING EQUIPMENT~~

~~SECTION 3304 PRECAUTIONS AGAINST FIRE~~

~~SECTION 3305 FLAMMABLE AND COMBUSTIBLE LIQUIDS~~

~~SECTION 3306 FLAMMABLE GASES~~

~~SECTION 3307 EXPLOSIVE MATERIALS~~

~~SECTION 3308 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION~~

~~SECTION 3309 FIRE REPORTING~~

~~SECTION 3310 ACCESS FOR FIRE FIGHTING~~

~~SECTION 3311 MEANS OF EGRESS~~

~~SECTION 3312 WATER SUPPLY FOR FIRE PROTECTION~~

~~SECTION 3313 STANDPIPES~~

~~SECTION 3314 AUTOMATIC SPRINKLER SYSTEM~~

~~SECTION 3315 PORTABLE FIRE EXTINGUISHERS~~

~~SECTION 3316 MOTORIZED CONSTRUCTION EQUIPMENT~~

SECTION 3317 SAFEGUARDING ROOFING OPERATIONS

Reason: This change takes the current requirements of Chapter 33 of the IFC and incorporates them into Chapter 33 of the IBC. It makes no changes in technical requirements and retains all requirements of both codes. Explanations of each editorial change is given section by section at the end of this reason statement.

The purview of the fire code committee for sections currently under their purview (indicated by an “[F]” before the appropriate sections), and the authority of the fire code official where the fire code official’s approval is currently required, are preserved. The practice of having key fire safety provisions in the IBC that are maintained by the IFC committee and enforced by the fire code official is already established. Many provisions of Chapter 9 do this.

Requirements for fire safety are currently found in both the IBC and the IFC, with considerable overlap. For instance, requirements for fire extinguishers, means of egress, standpipes, sprinkler systems, and water supply are currently in both codes.

Most significant construction fires are the result of noncompliance with current code requirements. The consolidation of these chapters into the IBC will reduce the likelihood of code violations leading to fire, and will be beneficial for several other reasons. First, there are jurisdictions that do not adopt the IFC and the requirements will be more accessible to them. Second, enforcement activities for key provisions such as fire watches, a fire prevention program superintendent and plan, temporary heating equipment safety, cooking areas, rubbish and debris disposal, hot work precautions, roofing precautions, and access for firefighting—all which appear in the IFC but not the IBC—are less likely to be neglected. Third, problems in correlation of overlapping requirements will be eliminated.

Here is a section-by-section explanation of modifications:

Chapter 33 title: changed to reflect the inclusion of IFC fire safety provisions.

3301.1: General: the scope is expanded to include the current scope of the Chapter 33 of the IFC, including required compliance with NFPA 241 for items not specifically addressed.

3301.2: Purpose: the IBC currently has no Purpose section, this is brought over from the IFC and modified to make it clear that fire safety is one purpose among others.

3301.3 Storage and placement: renumbering only.

3302.3 Fire safety during construction: deleted since requiring compliance with Chapter 33 of the IFC is no longer necessary; all the fire safety provisions of Chapter 33 of the IFC are being added here.

3303.7 Fire safety during demolition: deleted since requiring compliance with Chapter 33 of the IFC is no longer necessary; all the fire safety provisions of Chapter 33 of the IFC are being added here.

3309 TEMPORARY HEATING EQUIPMENT: all subsections 3309.1 through 3309.6 are unchanged from parallel provisions in Section 3303 of the IFC, except to add references to the IFC where appropriate.

3310 PRECAUTIONS AGAINST FIRE: all subsections 3310.1 through 3310.8 are unchanged from parallel provisions in Section 3304 of the IFC, except to add reference to the IFC where appropriate and editorial modifications to preserve the authority of the fire code official in subsections 3310.1, 3310.3, 3310.5.2, and 3310.8.

3311 FLAMMABLE AND COMBUSTIBLE LIQUIDS: all subsections 3311.1 through 3311.6 are unchanged from parallel provisions in Section 3305 of the IFC, except to add references to the IFC where appropriate.

3312 FLAMMABLE GASES: all subsections 3312.1 through 3312.2.1 are unchanged from parallel provisions in Section 3306 of the IFC, except to add references to the IFC where appropriate.

3313 EXPLOSIVE MATERIALS: all subsections 3313.1 through 3313.3 are unchanged from parallel provisions in Section 3307 of the IFC, except to add references to the IFC where appropriate, and editorial modifications to preserve the authority of the fire code official in subsection 3313.3.

3314 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION: all subsections 3314.1 through 3314.8 are unchanged from parallel provisions in Section 3308 of the IFC, except to add references to the IFC where appropriate, and editorial modifications to preserve the authority of the fire code official in subsection 3314.3.

3315 FIRE REPORTING: Subsection 3315.1 is unchanged from parallel provisions in Section 3309 of the IFC except to editorial modification to preserve the authority of the fire code official.

3316 ACCESS FOR FIRE FIGHTING: Subsections 3316.1 AND 3316.2 are unchanged from parallel provisions in Section 3310 of the IFC, except to add a reference to the IFC where appropriate in 3316.2 and an editorial modification to preserve the authority of the fire code official in subsection 3316.1.

3317 FIRE EXTINGUISHERS is current IBC Section 3309, which parallel the current provisions of IFC 3315 Portable Fire Extinguishers. The requirements were identical except for minor editorial wording such as "not less than" vs. "not fewer than," and "including, but not limited to" in one of the items. The wording of the IFC was used, and an editorial change was made to 3317.1 to retain the authority of the fire code official in addition to the building official for enforcement, since the same requirement was found in both codes.

(Current IBC subsection 3309.2 Fire hazards was deleted; it is no longer necessary since all fire safety provisions of Chapter 33 of the IFC are being added.)

3318 MEANS OF EGRESS is current IBC Section 3310, which parallels the current provisions of IFC 3311 Means of Egress.

3318.1 Stairways required: renumbered only.

3318.2 Maintenance of means of egress: the requirements of this subsection were essentially the same as IFC Section 3311.2, but the wording differed, especially for the exception. The word "required" in front of means of egress was brought over from the fire code, and the exception was modified to incorporate accessible means of egress, which appeared in the fire code. The revisions were made to incorporate the intent of both codes, which were thought to be the same. Editorial changes were made to retain the authority of the fire code official for approval since similar provisions for temporary means of egress were found in both codes.

3319 STANDPIPES is current IBC Section 3311, which parallel the current provisions of IFC 3313. Subsections 3319.1, 3319.2, and 3319.3 have been renumbered only.

3320 AUTOMATIC SPRINKLER SYSTEM is current IBC Section 3312, which parallel the current provisions of IFC 3314.

3320.1 Completion before occupancy: editorially modified to retain references to code sections in the IBC and IFC as they appear in their respective codes, and to retain the authority of both the building officials and fire code official from the respective codes.

3320.2 Operation of valves: renumbered only. "Shall be permitted" as used by the IBC was retained instead of "shall be allowed" per the IFC.

3321 WATER SUPPLY FOR FIRE PROTECTION is current IBC Section 3313, which parallel the current provisions of IFC 3312.

3321.1 Where required: editorial changes were made to make it clear that approvals are needed from both the building official and the fire code official, since approval is currently required by each code.

3314 FIRE WATCH DURING CONSTRUCTION was deleted since the identical requirement appears in proposed Section 3310.5.1, brought over from the IFC.

3322 MOTORIZED CONSTRUCTION EQUIPMENT is current section 3316 of the IFC.

3322.1 Conditions of use: an editorial change was made in item 4 to retain the authority of the fire code official.

3323 SAFEGUARDING ROOFING OPERATIONS is current section 3317 the IFC. Editorial changes were made to subsections 3323.1 and 3323.1 to make appropriate reference to the IFC for referenced code sections.

Here are the current IFC sections and their corresponding sections in this proposal:

IFC Section 3301: it remains in the IFC.

IFC Section 3302: deleted as unnecessary to follow IBC convention.

IFC 3303: proposed IBC 3309

IFC 3304: proposed IBC 3310

IFC 3305: proposed IBC 3311

IFC 3306: proposed IBC 3312

IFC 3307: proposed IBC 3313

IFC 3308: proposed IBC 3314

IFC 3309: proposed IBC 3315

IFC 3310: proposed IBC 3316

IFC 3311: proposed IBC 3318

IFC 3312: proposed IBC 3321

IFC 3313: proposed IBC 3319

IFC 3314: proposed IBC 3320

IFC 3315: proposed IBC 3317

IFC 3316: proposed IBC 3322

IFC 3317: proposed IBC 3323

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Currently the IBC requires that all the fire safety requirements of Chapter 33 of the IFC be enforced (IBC Section 3302.3). Therefore the moving of these provisions into the IBC will have no effect on the cost of construction.

Analysis: NFPA 56 and NFPA 241 are already referenced in the I-codes. Note that there has been erratum that changed the edition of NFPA 241 referenced in the 2018 IFC to the 2013 edition.

F262-18 Part I

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon concern that these provisions are already referenced in the IBC and relocation of requirements is not necessary. In addition this is consistent with the action taken on Part II of this proposal. (Vote: 13-0)

Assembly Action:

None

F262-18 Part I

Individual Consideration Agenda

Public Comment 1:

Proponent: Paul Coats, PE, CBO, representing American Wood Council (pcoats@awc.org) requests As Modified by This Public Comment.

Replace as follows:

2018 International Building Code

3302.3 Fire safety during construction. Fire safety during construction shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code. Compliance with the fire safety provisions of NFPA 241 is required for items not specifically addressed.

3303.7 Fire safety during demolition. Fire safety during demolition shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code. Compliance with the fire safety provisions of NFPA 241 is required for items not specifically addressed.

Commenter's Reason: The direct reference to NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, is retained from the original proposal. Compliance with NFPA 241 is required in the scope of Chapter 33 of the IFC, which is referenced already in these sections. Therefore there is no change in requirements. However, a direct reference to NFPA 241 in the IBC may have benefit for jurisdictions that do not adopt the IFC or are governed by statutes that delineate enforcement responsibilities according to code. This would allow building officials to enforce the provisions of NFPA 241 if necessary.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction. Compliance with Chapter 33 of the IFC, which in turn requires compliance with NFPA 241 in its scope, is already required by Sections 3302.3 and 3303.7. Therefore there is no change in requirements that would affect the cost of construction.

F262-18 Part I

F262-18 Part II

IBC: Chapter 33, 3301.1, 3301.2, 3302.3, 3303.7, 3309, 3310, 3311, 3312, 3313, 3314, 3315 (New), 3316(New), 322(New), 3323 (New), Chapter 35

Proposed Change as Submitted

Proponent: Paul Coats, American Wood Council, representing American Wood Council (pcoats@awc.org)

2018 International Building Code

Revise as follows

CHAPTER **33 SAFEGUARDS AND FIRE PREVENTION DURING CONSTRUCTION**

SECTION 3301 GENERAL

3301.1 Scope. The provisions of this chapter shall govern safety during construction, alteration, and demolition operations, including structures in underground locations, and the protection of adjacent public and private properties. Compliance with NFPA 241 is required for items not specifically addressed herein.

3301.2 Purpose. This chapter prescribes minimum safeguards for construction, alteration and demolition operations, including minimum safeguards to provide reasonable safety to life and property from fire during such operations.

~~3301.2~~3301.3 Storage and placement. Construction equipment and materials shall be stored and placed so as not to endanger the public, the workers or adjoining property for the duration of the construction project.

SECTION 3302 CONSTRUCTION SAFEGUARDS

~~3302.3 Fire safety during construction.~~ ~~Fire safety during construction shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code.~~

SECTION 3303 DEMOLITION

Delete without substitution

~~3303.7 Fire safety during demolition.~~ ~~Fire safety during demolition shall comply with the applicable requirements of this code and the applicable provisions of Chapter 33 of the International Fire Code.~~

SECTION 3309 TEMPORARY HEATING EQUIPMENT

Add new text as follows

3309.1 Listed. Temporary heating devices shall be listed and labeled. The installation, maintenance and use of temporary heating devices shall be in accordance with the listing and the manufacturer's instructions.

3309.2 Oil-fired heaters. Oil-fired heaters shall comply with Section 603 of the International Fire Code.

3309.3 LP-gas heaters. Fuel supplies for liquefied-petroleum gas-fired heaters shall comply the International Fuel Gas Code and Chapter 61 of the International Fire Code.

3309.4 Refueling. Refueling operations for liquid-fueled equipment or appliances shall be conducted in accordance with Section 5705 of the International Fire Code. The equipment or appliance shall be allowed to cool prior to refueling.

3309.5 Installation. Clearance to combustibles from temporary heating devices shall be maintained in accordance with the labeled equipment. When in operation, temporary heating devices shall be fixed in place and protected from damage, dislodgement or overturning in accordance with the manufacturer's instructions.

3309.6 Supervision. The use of temporary heating devices shall be supervised and maintained only by competent

personnel.

SECTION 3310 PRECAUTIONS AGAINST FIRE

3310.1 Smoking. Smoking shall be prohibited except in areas approved by the fire code official. Signs shall be posted in accordance with Section 310 of the International Fire Code. In areas approved by the fire code official where smoking is permitted, ashtrays approved by the fire code official shall be provided in accordance with Section 310 of the International Fire Code.

3310.2 Combustible debris, rubbish and waste. Combustible debris, rubbish and waste material shall comply with the requirements of Sections 3310.2.1 through 3310.2.4.

3310.2.1 Combustible waste material accumulation. Combustible debris, rubbish and waste material shall not be accumulated within buildings.

3310.2.2 Combustible waste material removal. Combustible debris, rubbish and waste material shall be removed from buildings at the end of each shift of work.

3310.2.3 Rubbish containers. Where rubbish containers with a capacity exceeding 5.33 cubic feet (40 gallons) (0.15 m³) are used for temporary storage of combustible debris, rubbish and waste material, they shall have tightfitting or self-closing lids. Such rubbish containers shall be constructed entirely of materials that comply with either of the following:

1. Noncombustible materials.
2. Materials that meet a peak rate of heat release not exceeding 300 kW/m² when tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m² in the horizontal orientation.

3310.2.4 Spontaneous ignition. Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a listed disposal container.

3310.3 Burning of combustible debris, rubbish and waste. Combustible debris, rubbish and waste material shall not be disposed of by burning on the site unless approved by the fire code official.

3310.4 Open burning. Open burning shall comply with Section 307 of the International Fire Code.

3310.5 Fire watch. Where required by the fire code official or the prefire plan established in accordance with Section 3314.3, a fire watch shall be provided for building demolition and for building construction that is hazardous in nature, such as temporary heating or hot work.

3310.5.1 Fire watch during construction. Where required by the fire code official, a fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade.

3310.5.2 Fire watch personnel. Trained personnel shall be provided to serve as an on-site fire watch. Fire watch personnel shall be provided with not fewer than one means for notification of the fire department which is acceptable to the fire code official, and the sole duty of such personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable. Fire watch personnel shall be trained in the use of portable fire extinguishers.

3310.5.3 Fire watch location and records. The fire watch shall include areas specified by the prefire plan established in accordance with Section 3314.3. The fire watch personnel shall keep a record of all time periods of duty, including a log entry each time the site was patrolled and each time a structure under construction was entered and inspected. The records and log entries shall be made available for review by the fire code official upon request.

3310.6 Cutting and welding. Welding, cutting, open torches and other hot work operations and equipment shall comply with Chapter 35 of the International Fire Code.

3310.7 Electrical. Temporary wiring for electrical power and lighting installations used in connection with the construction, alteration or demolition of buildings, structures, equipment or similar activities shall comply with NFPA 70.

3310.8 Cooking. Cooking shall be prohibited except in designated cooking areas approved by the fire code official. Signs with a minimum letter height of 3 inches (76 mm) and a minimum brush stroke of 1/2 inch (13 mm) shall be posted in

conspicuous locations in designated cooking areas and state:

DESIGNATED COOKING AREA

COOKING OUTSIDE OF A DESIGNATED COOKING

AREA IS PROHIBITED

SECTION 3311 FLAMMABLE AND COMBUSTIBLE LIQUIDS

3311.1 Storage of flammable and combustible liquids. Storage of flammable and combustible liquids shall be in accordance with Section 5704 of the International Fire Code.

3311.2 Class I and Class II liquids. The storage, use and handling of flammable and combustible liquids at construction sites shall be in accordance with Section 5706.2 of the International Fire Code. Ventilation shall be provided for operations involving the application of materials containing flammable solvents.

3311.3 Housekeeping. Flammable and combustible liquid storage areas shall be maintained clear of combustible vegetation and waste materials. Such storage areas shall not be used for the storage of combustible materials.

3311.4 Precautions against fire. Sources of ignition and smoking shall be prohibited in flammable and combustible liquid storage areas. Signs shall be posted in accordance with Section 310 of the International Fire Code.

3311.5 Handling at point of final use. Class I and II liquids shall be kept in safety containers approved by the fire code official.

3311.6 Leakage and spills. Leaking vessels shall be immediately repaired or taken out of service and spills shall be cleaned up and disposed of properly.

SECTION 3312 FLAMMABLE GASES

3312.1 Storage and handling. The storage, use and handling of flammable gases shall comply with Chapter 58 of the International Fire Code.

3312.2 Cleaning with flammable gas. Flammable gases shall not be used to clean or remove debris from piping open to the atmosphere.

3312.2.1 Pipe cleaning and purging. The cleaning and purging of flammable gas piping systems, including cleaning new or existing piping systems, purging piping systems into service and purging piping systems out of service, shall comply with NFPA 56.

Exceptions:

1. Compressed gas piping systems other than fuel gas piping systems where in accordance with Chapter 53 of the International Fire Code.
2. Piping systems regulated by the International Fuel Gas Code.
3. Liquefied petroleum gas systems in accordance with Chapter 61 of the International Fire Code.

SECTION 3313 EXPLOSIVE MATERIALS

3313.1 Storage and handling. Explosive materials shall be stored, used and handled in accordance with Chapter 56 of the International Fire Code.

3313.2 Supervision. Blasting operations shall be conducted in accordance with Chapter 56 of the International Fire Code.

3313.3 Demolition using explosives. Fire hoses approved by the fire code official for use by demolition personnel shall be maintained at the demolition site wherever explosives are used for demolition. Such fire hoses shall be connected to an water supply approved by the fire code official and shall be capable of being brought to bear on post-detonation fires anywhere on the site of the demolition operation.

SECTION 3314 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION

3314.1 Program development and maintenance. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of a written plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff, and staff training requirements. The plan shall be made available for review by the fire code official upon request.

3314.2 Program superintendent. The owner shall designate a person to be the fire prevention program superintendent who shall be responsible for the fire prevention program and ensure that it is carried out through completion of the project. The fire prevention program superintendent shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the superintendent shall be responsible for the guard service.

3314.3 Prefire plans. The fire prevention program superintendent shall develop and maintain an prefire plan approved by the fire code official and in cooperation with the fire chief. The fire chief and the fire code official shall be notified of changes affecting the utilization of information contained in such prefire plans.

3314.4 Training. Training of responsible personnel in the use of fire protection equipment shall be the responsibility of the fire prevention program superintendent. Records of training shall be kept and made a part of the written plan for the fire prevention program.

3314.5 Fire protection devices. The fire prevention program superintendent shall determine that all fire protection equipment is maintained and serviced in accordance with this code. The quantity and type of fire protection equipment shall be approved by the fire code official. Fire protection equipment shall be inspected in accordance with the fire protection program.

3314.6 Hot work operations. The fire prevention program superintendent shall be responsible for supervising the permit system for hot work operations in accordance with Chapter 35 of the International Fire Code.

3314.7 Impairment of fire protection systems. Impairments to any fire protection system shall be in accordance with Section 901 of the International Fire Code.

3314.7.1 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. 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.

3314.8 Temporary covering of fire protection devices. Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

SECTION 3315 FIRE REPORTING

3315.1 Emergency telephone. Emergency telephone facilities with ready access shall be provided in an a location approved by the fire code official at the construction site, or an equivalent means of communication approved by the fire code official 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. Alternatively, where an equivalent means of communication has been approved by the fire code official, 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.

SECTION 3316 ACCESS FOR FIRE FIGHTING

3316.1 Required access. Vehicle access approved by the fire code official for firefighting 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.

3316.2 Key boxes. Key boxes shall be provided as required by Chapter 5 of the International Fire Code.

SECTION 33093317 FIRE EXTINGUISHERS

~~[F] 3309.13317.1~~ **Where required.** Structures under construction, *alteration* or demolition shall be provided with not fewer than one ~~approved~~ portable fire extinguisher in accordance with Section 906, approved by the building official and the fire code official, and sized for not less than ordinary hazard as follows:

1. At each *stairway* on all floor levels where combustible materials have accumulated.
2. In every storage and construction shed.
3. Additional portable fire extinguishers shall be provided where special hazards exist, such as the storage and use of flammable and combustible liquids.

Delete without substitution

~~[F] 3309.2 Fire hazards.~~ The provisions of this code and the International Fire Code shall be strictly observed to safeguard against all fire hazards attendant upon construction operations.

SECTION 33103318 MEANS OF EGRESS

~~3310.13318.1~~ **Stairways required.** Where building construction exceeds 40 feet (12 192 mm) in height above the lowest level of fire department vehicle access, a temporary or permanent *stairway* shall be provided. As construction progresses, such *stairway* shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~[F] 3310.23318.2~~ **Maintenance of means of egress.** ~~Means~~ Required means of egress and required accessible *means of egress* shall be maintained at all times during construction, demolition, remodeling or *alterations* and *additions* to any building.

Exception: Existing *means of egress* need not be maintained where ~~approved~~

temporary *means of egress* and temporary accessible means of egress systems and facilities, approved by the building official and the fire code official, are provided.

SECTION 33113319 STANDPIPES

~~[F] 3311.13319.1~~ **Where required.** In buildings required to have standpipes by Section 905.3.1, not fewer 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 standpipes shall be provided with fire department hose connections at locations adjacent to *stairways* complying with Section ~~3310.1-3318.1~~. As construction progresses, such standpipes shall be extended to within one floor of the highest point of construction having secured decking or flooring.

~~[F] 3311.23319.2~~ **Buildings being demolished.** Where a building is being demolished and a standpipe exists within such a building, such standpipe shall be maintained in an operable condition so as to be available for use by the fire department. Such standpipe shall be demolished with the building but shall not be demolished more than one floor below the floor being demolished.

~~[F] 3311.33319.3~~ **Detailed requirements.** Standpipes shall be installed in accordance with the provisions of Chapter 9.

Exception: Standpipes shall be either temporary or permanent in nature, and with or without a water supply, provided that such standpipes conform to the requirements of Section 905 as to capacity, outlets and materials.

SECTION 33123320 AUTOMATIC SPRINKLER SYSTEM

~~[F] 3312.13320.1~~ **Completion before occupancy.** In buildings where an *automatic sprinkler system* is required by this code or the International Fire Code, it shall be unlawful to occupy any portion of a building or structure until the *automatic sprinkler system* installation has been tested and approved by the building and fire code official, except as provided in Section ~~111.3-111.3~~ of this code or Section 105.3.4 of the International Fire Code.

~~[F] 3312.23320.2~~ **Operation of valves.** Operation of sprinkler control valves shall be permitted only by properly authorized personnel and shall be accompanied by notification of duly designated parties. When the sprinkler protection is being regularly turned off and on to facilitate connection of newly completed segments, the sprinkler control valves shall be checked at the end of each work period to ascertain that protection is in service.

SECTION 33133321 WATER SUPPLY FOR FIRE PROTECTION

~~[F] 3313-13321.1~~ **Where required.** ~~An approved~~ water supply for fire protection, either temporary or permanent, shall be approved by the building official and fire code official and made available as soon as combustible material arrives on the site.

~~SECTION 3314 FIRE WATCH DURING CONSTRUCTION~~

SECTION 3322 MOTORIZED CONSTRUCTION EQUIPMENT

3322.1 Conditions of use. Internal-combustion-powered construction equipment shall be used in accordance with all of the following conditions:

1. Equipment shall be located so that exhausts do not discharge against combustible material.
2. Exhausts shall be piped to the outside of the building.
3. Equipment shall not be refueled while in operation.
4. Fuel for equipment shall be stored in an area outside of the building which is approved by the fire code official.

SECTION 3323 SAFEGUARDING ROOFING OPERATIONS

3323.1 General. Roofing operations utilizing heat-producing systems or other ignition sources shall be conducted in accordance with Sections 3323.2 and 3323.3 and Chapter 35 of the International Fire Code.

3323.2 Asphalt and tar kettles. Asphalt and tar kettles shall be operated in accordance with Section 303 of the International Fire Code.

3323.3 Fire extinguishers for roofing operations. Fire extinguishers shall comply with Section 906. There shall be not less than one multiple-purpose portable fire extinguisher with a minimum 3-A 40-B:C rating on the roof being covered or repaired.

CHAPTER 35 REFERENCED STANDARDS

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

56--17:

Standard for Fire and Explosion Prevention during Cleaning and Purging of Flammable Gas Piping Systems

241--13:

Standard for Safeguarding Construction, Alteration, and Demolition Operations

Reason: This change takes the current requirements of Chapter 33 of the IFC and incorporates them into Chapter 33 of the IBC. It makes no changes in technical requirements and retains all requirements of both codes. Explanations of each editorial change is given section by section at the end of this reason statement.

The purview of the fire code committee for sections currently under their purview (indicated by an "[F]" before the appropriate sections), and the authority of the fire code official where the fire code official's approval is currently required, are preserved. The practice of having key fire safety provisions in the IBC that are maintained by the IFC committee and enforced by the fire code official is already established. Many provisions of Chapter 9 do this.

Requirements for fire safety are currently found in both the IBC and the IFC, with considerable overlap. For instance, requirements for fire extinguishers, means of egress, standpipes, sprinkler systems, and water supply are currently in both codes.

Most significant construction fires are the result of noncompliance with current code requirements. The consolidation of these chapters into the IBC will reduce the likelihood of code violations leading to fire, and will be beneficial for several other reasons. First, there are jurisdictions that do not adopt the IFC and the requirements will be more accessible to them. Second, enforcement activities for key provisions such as fire watches, a fire prevention program superintendent

and plan, temporary heating equipment safety, cooking areas, rubbish and debris disposal, hot work precautions, roofing precautions, and access for firefighting—all which appear in the IFC but not the IBC—are less likely to be neglected. Third, problems in correlation of overlapping requirements will be eliminated.

Here is a section-by-section explanation of modifications:

Chapter 33 title: changed to reflect the inclusion of IFC fire safety provisions.

3301.1: General: the scope is expanded to include the current scope of the Chapter 33 of the IFC, including required compliance with NFPA 241 for items not specifically addressed.

3301.2: Purpose: the IBC currently has no Purpose section, this is brought over from the IFC and modified to make it clear that fire safety is one purpose among others.

3301.3 Storage and placement: renumbering only.

3302.3 Fire safety during construction: deleted since requiring compliance with Chapter 33 of the IFC is no longer necessary; all the fire safety provisions of Chapter 33 of the IFC are being added here.

3303.7 Fire safety during demolition: deleted since requiring compliance with Chapter 33 of the IFC is no longer necessary; all the fire safety provisions of Chapter 33 of the IFC are being added here.

3309 TEMPORARY HEATING EQUIPMENT: all subsections 3309.1 through 3309.6 are unchanged from parallel provisions in Section 3303 of the IFC, except to add references to the IFC where appropriate.

3310 PRECAUTIONS AGAINST FIRE: all subsections 3310.1 through 3310.8 are unchanged from parallel provisions in Section 3304 of the IFC, except to add reference to the IFC where appropriate and editorial modifications to preserve the authority of the fire code official in subsections 3310.1, 3310.3, 3310.5.2, and 3310.8.

3311 FLAMMABLE AND COMBUSTIBLE LIQUIDS: all subsections 3311.1 through 3311.6 are unchanged from parallel provisions in Section 3305 of the IFC, except to add references to the IFC where appropriate.

3312 FLAMMABLE GASES: all subsections 3312.1 through 3312.2.1 are unchanged from parallel provisions in Section 3306 of the IFC, except to add references to the IFC where appropriate.

3313 EXPLOSIVE MATERIALS: all subsections 3313.1 through 3313.3 are unchanged from parallel provisions in Section 3307 of the IFC, except to add references to the IFC where appropriate, and editorial modifications to preserve the authority of the fire code official in subsection 3313.3.

3314 OWNER'S RESPONSIBILITY FOR FIRE PROTECTION: all subsections 3314.1 through 3314.8 are unchanged from parallel provisions in Section 3308 of the IFC, except to add references to the IFC where appropriate, and editorial modifications to preserve the authority of the fire code official in subsection 3314.3.

3315 FIRE REPORTING: Subsection 3315.1 is unchanged from parallel provisions in Section 3309 of the IFC except to editorial modification to preserve the authority of the fire code official.

3316 ACCESS FOR FIRE FIGHTING: Subsections 3316.1 AND 3316.2 are unchanged from parallel provisions in Section 3310 of the IFC, except to add a reference to the IFC where appropriate in 3316.2 and an editorial modification to preserve the authority of the fire code official in subsection 3316.1.

3317 FIRE EXTINGUISHERS is current IBC Section 3309, which parallel the current provisions of IFC 3315 Portable Fire Extinguishers. The requirements were identical except for minor editorial wording such as “not less than” vs. “not fewer than,” and “including, but not limited to” in one of the items. The wording of the IFC was used, and an editorial change was made to 3317.1 to retain the authority of the fire code official in addition to the building official for enforcement, since the same requirement was found in both codes.

(Current IBC subsection 3309.2 Fire hazards was deleted; it is no longer necessary since all fire safety provisions of Chapter 33 of the IFC are being added.)

3318 MEANS OF EGRESS is current IBC Section 3310, which parallels the current provisions of IFC 3311 Means of Egress.

3318.1 Stairways required: renumbered only.

3318.2 Maintenance of means of egress: the requirements of this subsection were essentially the same as IFC Section 3311.2, but the wording differed, especially for the exception. The word "required" in front of means of egress was brought over from the fire code, and the exception was modified to incorporate accessible means of egress, which appeared in the fire code. The revisions were made to incorporate the intent of both codes, which were thought to be the same. Editorial changes were made to retain the authority of the fire code official for approval since similar provisions for temporary means of egress were found in both codes.

3319 STANDPIPES is current IBC Section 3311, which parallel the current provisions of IFC 3313. Subsections 3319.1, 3319.2, and 3319.3 have been renumbered only.

3320 AUTOMATIC SPRINKLER SYSTEM is current IBC Section 3312, which parallel the current provisions of IFC 3314.

3320.1 Completion before occupancy: editorially modified to retain references to code sections in the IBC and IFC as they appear in their respective codes, and to retain the authority of both the building officials and fire code official from the respective codes.

3320.2 Operation of valves: renumbered only. "Shall be permitted" as used by the IBC was retained instead of "shall be allowed" per the IFC.

3321 WATER SUPPLY FOR FIRE PROTECTION is current IBC Section 3313, which parallel the current provisions of IFC 3312.

3321.1 Where required: editorial changes were made to make it clear that approvals are needed from both the building official and the fire code official, since approval is currently required by each code.

3314 FIRE WATCH DURING CONSTRUCTION was deleted since the identical requirement appears in proposed Section 3310.5.1, brought over from the IFC.

3322 MOTORIZED CONSTRUCTION EQUIPMENT is current section 3316 of the IFC.

3322.1 Conditions of use: an editorial change was made in item 4 to retain the authority of the fire code official.

3323 SAFEGUARDING ROOFING OPERATIONS is current section 3317 the IFC. Editorial changes were made to subsections 3323.1 and 3323.1 to make appropriate reference to the IFC for referenced code sections.

Here are the current IFC sections and their corresponding sections in this proposal:

IFC Section 3301: it remains in the IFC.

IFC Section 3302: deleted as unnecessary to follow IBC convention.

IFC 3303: proposed IBC 3309

IFC 3304: proposed IBC 3310

IFC 3305: proposed IBC 3311

IFC 3306: proposed IBC 3312

IFC 3307: proposed IBC 3313

IFC 3308: proposed IBC 3314

IFC 3309: proposed IBC 3315

IFC 3310: proposed IBC 3316

IFC 3311: proposed IBC 3318

IFC 3312: proposed IBC 3321

IFC 3313: proposed IBC 3319

IFC 3314: proposed IBC 3320

IFC 3315: proposed IBC 3317

IFC 3316: proposed IBC 3322

IFC 3317: proposed IBC 3323

Cost Impact: The code change proposal will not increase or decrease the cost of construction. Currently the IBC requires that all the fire safety requirements of Chapter 33 of the IBC be enforced (IBC Section 3302.3). Therefore the moving of these provisions into the IBC will have no effect on the cost of construction.

Analysis: NFPA 56 and NFPA 241 are already referenced in the I-codes. Note that there has been erratum that changed the edition of NFPA 241 referenced in the 2018 IBC to the 2013 edition.

F262-18 Part II

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal would be difficult to enforce and time consuming. Some jurisdictions do not have a fire department. Putting the burden on the owner and the construction manager is the proper way to handle this situation. This complicates and muddies the code and makes the construction manager's job more difficult. (Vote: 14-0)

Assembly Action:

None

F262-18 Part II

F263-18

IFC: 3308

Proposed Change as Submitted

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

2018 International Fire Code

Revise as follows

SECTION 33083303 OWNER'S RESPONSIBILITY FOR RESPONSIBILITY FOR FIRE PROTECTION

~~3308-1~~**3303.1 Program development and maintenance.** The *owner* or *owner's* authorized agent shall be responsible for the development, implementation and maintenance of a written plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, *alteration* or demolition work. The plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff, and staff training requirements. The plan shall be made available for review by the *fire code official* upon request.

~~3308-2~~**3303.2 Program superintendent.** The *owner* shall designate a person to be the fire prevention program superintendent who shall be responsible for the fire prevention program and ensure that it is carried out through completion of the project. The fire prevention program superintendent shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the superintendent shall be responsible for the guard service.

Add new text as follows

3303.3 Daily fire safety inspection. The fire prevention program superintendent shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on site until a certificate of occupancy has been issued. Documentation shall be immediately available on site for presentation to the fire code official upon request.

Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 110.1 and shall result in the issuance of a notice of violation in accordance with Section 110.3 to the fire prevention program superintendent. Upon the third offence in any 30-day period, offense, the fire code official is authorized to issue a stop work order shall be issued in accordance with Section 112, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the fire code official.

1. Any contractors entering the site to perform hot work each day have been instructed in hot work safety requirements in Chapter 35 and hot work is only performed in areas approved by the fire prevention superintendent.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the fire prevention superintendent when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3310 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet.
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.
10. Portable fire extinguishers are available in locations required by Section 3315 and 3317.3.

~~3308-3~~**3303.4 Prefire plans.** The fire prevention program superintendent shall develop and maintain an *approved* prefire plan in cooperation with the fire chief. The fire chief and the *fire code official* shall be notified of changes affecting the utilization of information contained in such prefire plans.

~~3308-4~~**3303.5 Training.** Training of responsible personnel in the use of fire protection equipment shall be the responsibility of the fire prevention program superintendent. Records of training shall be kept and made a part of the

written plan for the fire prevention program.

3308-53303.6 Fire protection devices. The fire prevention program superintendent shall determine that all fire protection equipment is maintained and serviced in accordance with this code. The quantity and type of fire protection equipment shall be *approved*. Fire protection equipment shall be inspected in accordance with the fire protection program.

3308-63303.7 Hot work operations. The fire prevention program superintendent shall be responsible for supervising the permit system for hot work operations in accordance with Chapter 35.

3308-73303.8 Impairment of fire protection systems. Impairments to any *fire protection system* shall be in accordance with Section 901.

3308-7-13303.8.1 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. 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.

3308-83303.9 Temporary covering of fire protection devices. Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

Reason: The number and magnitude of construction fires in the past few years has been well documented in NFPA loss reports and on national news. Many of these fires are not "accidental," but are instead the result of inexcusable carelessness...failing to follow basic fire safety practices. For some reason, it seems that there has been a loss of attention to fire safety at construction sites. Although major construction fires represent a relatively small percentage of the overall population of buildings under construction at any given time, the consequences of these fires is seeming to impact nearby buildings and neighborhoods with increasing frequency and increasing levels of damage. Contractors are busy trying to stay on schedule. Fire inspectors show up to look at specific inspection tasks, such as sprinkler inspections, without having time to look at construction fire safety concerns. Building inspectors are on tight inspection schedules and may not have time or be trained to look for fire safety concerns. It seems that nobody is focused on construction site fire safety. Ultimately, this responsibility falls on the owner and the fire prevention program superintendent to ensure compliance, and there needs to be a viable way to verify that the responsible parties are doing their code-required jobs.

Hence, this proposal is intended to serve as a hammer to make sure that there is a motivation to pay attention to basic fire safety requirements and to pin this responsibility on the owner and the fire prevention program superintendent. By requiring daily inspections and documentation, any fire or building inspector can simply request to see the checklist when at the site for any reason, and a clear enforcement path is specified when non-compliance is encountered. While it's true that someone could just do the paperwork exercise, the liability associated with fraudulently documenting compliance in the event of an incident would be significant, and presumably, there will be cases where code officials will spot check compliance.

Unfortunately, there is no perfect solution to this issue. But this proposal represents a significant step forward with regard to getting responsible parties to pay attention to a significant and ongoing issue.

This proposal also recommends relocating Section 3308 to Section 3303. This is perhaps the most important part of Chapter 33, and the requirements need to be right up front.

Cost Impact: The code change proposal will increase the cost of construction. The additional time required for personnel to complete the tasks required by this section will increase the cost of construction.

F263-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 3303.3 Daily fire safety inspection. The fire prevention program superintendent shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on site until a certificate of occupancy has been issued. Documentation shall be immediately available on site for presentation to the fire code official upon request.

Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 110.1 and shall result in the issuance of a notice of violation in accordance with Section 110.3 to the fire prevention program superintendent. Upon the third ~~offense in any 30-day period,~~ offense, the fire code official is authorized to issue a stop work order ~~shall be issued~~ in accordance with Section 112, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the fire code official.

1. Any contractors entering the site to perform hot work each day have been instructed in hot work safety requirements in Chapter 35 and hot work is only performed in areas approved by the fire prevention superintendent.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the fire prevention superintendent when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3310 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet.
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.
10. Portable fire extinguishers are available in locations required by Section 3315 and 3317.3.

Committee Reason: The proposal was approved based upon the need for more tools for the code official to address hazards on construction sites. This provides a daily emphasis on the jobsite that they have a plan in place that needs to be followed. The checklist was felt to be helpful especially for alterations where the building may be occupied. The modification simply provides the authority to the fire code official to issue a stop work order versus it being mandatory after 30 days. This gives more flexibility to address each situation individually. There was some concern that this should be focused upon larger projects. There is a concern with movement of administrative provisions outside of Chapter 1. Some concern that projects may be shutdown based upon paperwork not being complete. There was also a suggestion that this be refined to coordinate the checklist with what is already required in Chapter 33. (Vote: 11-3)

Assembly Action:

None

F263-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Catlett, J.D. Catlett Code Consulting, LLC, representing BOMA International (jcatlett@boma.org) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

3303.3 Daily fire safety inspection. The fire prevention program superintendent shall be responsible for completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on site until a certificate of occupancy has been issued. Documentation shall be immediately available on site for presentation to the fire code official upon request.

~~Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 110.1 and shall result in the issuance of a notice of violation in accordance with Section 110.3 to the fire prevention program superintendent. Upon the third offense, the fire code official is authorized to issue a stop work order in accordance with Section 112, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the fire code official. be subject to actions by the fire code official as provided in Sections 110 and 112.~~

1. Any contractors entering the site to perform hot work each day have been instructed in hot work safety requirements in Chapter 35 and hot work is only performed in areas approved by the fire prevention superintendent.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the fire prevention superintendent when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3310 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet.
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.
10. Portable fire extinguishers are available in locations required by Section 3315 and 3317.3.

Commenter's Reason: BOMA agrees with the intended language that adds the fire safety checklist to the responsibilities of a construction operation. However, administrative provisions should not be part of technical provisions. Sections 110 and 112 provide adequate direction and authority to address violations of the IFC. Additionally, the code should allow the fire official flexibility to gauge the level of violation of this section without direction that three violations constitute actions by the fire code official to stop work. A single violation could be egregious enough to warrant a stop-work order if fire safety violations noted on site constitute an immediate hazard. On the other hand, failing to check a box while it is obvious that onsite fire safety practices are being observed and promoted should not be grounds alone for stopping work.

The provisions as written do not establish a time frame for non-compliance. An example would be if the checklist is regularly completed and site fire safety compliance is obvious, but on three days during a six month period the checklist were not available due to oversight or misplacement by the job superintendent, the project would be subject to a stop-work order. The fire code official should have the flexibility to gauge the over-all compliance when considering stopping work. Although the provisions do not mandate action by the fire code official, an overzealous or new fire code official/fire inspector may cause project disruption without considering all of the elements addressed above.

BOMA feels that steps to insure compliance belong in the administrative provisions of the IFC and that the technical provisions should address desired technical outcomes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no cost impact as this public comment simply references existing requirements in Chapter 1. The overall code change will increase the cost of construction due to the requirement for daily inspections.

Public Comment 2:

Proponent: William Koffel, representing Self (wkoffel@koffel.com) requests As Modified by This Public Comment.

Further modify as follows:

2018 International Fire Code

3303.3 Daily fire safety inspection. The fire prevention program superintendent shall be responsible ~~for to verify~~

completion of a daily fire safety inspection at the project site. Each day, all building and outdoor areas shall be inspected to ensure compliance with the inspection list in this section. The results of each inspection shall be documented and maintained on site until a certificate of occupancy has been issued. Documentation shall be immediately available on site for presentation to the fire code official upon request.

Exception: The frequency of inspection are not required to occur daily where the frequency of inspections are performed and documented in accordance with an approved fire prevention program.

~~Failure to properly conduct, document and maintain documentation required by this section shall constitute an unlawful act in accordance with Section 110.1 and shall result in the issuance of a notice of violation in accordance with Section 110.3 to the fire prevention program superintendent. Upon the third offense, the fire code official is authorized to issue a stop work order in accordance with Section 112, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the fire code official.~~

1. Any contractors entering the site to perform hot work each day have been instructed in hot work safety requirements in Chapter 35 and hot work is only performed in areas approved by the fire prevention superintendent.
2. Temporary heating equipment is maintained away from combustible materials in accordance with the equipment manufacturer's instructions.
3. Combustible debris, rubbish and waste material is removed from the building in areas where work is not being performed.
4. Temporary wiring does not have exposed conductors.
5. Flammable liquids and other hazardous materials are stored in locations that have been approved by the fire prevention superintendent when not involved in work that is being performed.
6. Fire apparatus access roads required by Section 3310 are maintained clear of obstructions that reduce the width of the usable roadway to less than 20 feet.
7. Fire hydrants are clearly visible from access roads and are not obstructed.
8. The location of fire department connections to standpipe and in-service sprinkler systems are clearly identifiable from the access road and such connections are not obstructed.
9. Standpipe systems are in service and continuous to the highest work floor, as specified in Section 3313.
10. Portable fire extinguishers are available in locations required by Section 3315 and 3317.3.

3303.3.1 Violations. Failure to properly conduct, document and maintain documentation required by Section 3303.3 shall constitute an unlawful act in accordance with Section 110.1 and shall result in the issuance of a notice of violation in accordance with Section 110.3 to the fire prevention program superintendent. Upon the third offense, the fire code official is authorized to issue a stop work order in accordance with Section 112, and work shall not resume until satisfactory assurances of future compliance have been presented to and approved by the fire code official.

Commenter's Reason: The Public Comment accomplishes two objectives:

First, the language as approved by the Committee implies the the fire prevention program superintendent must be the one who performs and documents the inspections. On many construction projects, the actual inspections are delegated to a contractor. The owner, through the fire prevention program superintendent, should be responsible to verify that the inspections are being performed and documented. The proposed language clarifies what is believed to be the intent of the submitter of the proposal.

Secondly, an inspection frequency of daily may not be appropriate in all instances. In most instances the exception is likely to be used to allow inspections to be performed less than daily and that may be appropriate for some construction sites. However, there may be instances in which the fire prevention program will require inspections to be more frequent than daily. By referring to the approved fire prevention program, a dialogue must occur between the owner and the fire official to determine the key components of the fire prevention program and the fire official will approve the program.

Note for clarity of the new exception the second paragraph was moved to a new subsection 3303.3.1.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The impact of the Public Comment language will not increase the cost of construction and in some instances might decrease the cost of construction because it may decrease the frequency of some inspections.

F264-18

IFC: 3304.5, 3304.5.1, 3304.5.2, 3304.5.2.1, 3304.5.2.2, 3304.5.2.3, 3304.5.3, 3308.5.4, 3304.8, 3308.1, 3308.1.1, 3308.2, 3308.3, 3308.4, 3308.5, , 3308.6, 3308.7, 3308.8, 501.3, 501.3.1, 202

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Revise as follows

3304.5 Fire watch. Where required by the *fire code official* or the ~~pre-fire site safety~~ plan established in accordance with Section ~~3308.3~~3308.1, a fire watch shall be provided for building demolition and for building construction ~~that is hazardous in nature, such as temporary heating or hot work.~~ construction.

3304.5.1 Fire watch during construction. ~~Where required by the fire code official, a~~ A fire watch shall be provided during nonworking hours for new construction that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade at any point along the building perimeter, any new multi-story construction with an aggregate area exceeding 50,000 sq. ft. per story or as required by the fire code official.

3304.5.2 Fire watch personnel. ~~Trained personnel shall be provided to serve as an on-site fire watch. Fire watch personnel shall be provided with not fewer than one approved means for notification of the fire department, and the sole duty of such personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable. Fire watch personnel shall be trained in the use of portable fire extinguishers in accordance with this section.~~

Add new text as follows

3304.5.2.1 Duties. The primary duty of fire watch personnel shall be to perform constant patrols and watch for the occurrence of fire. The combination of fire watch duties and site security duties is acceptable.

3304.5.2.2 Training. Personnel shall be trained to serve as an on-site fire watch. Training shall include the use of portable fire extinguishers. Fire extinguishers and fire reporting shall be in accordance with Section 3309.

3304.5.2.3 Means of notification. Fire watch personnel shall be provided with not fewer than one approved means for notifying the fire department.

Revise as follows

3304.5.3 Fire watch location and records. The fire watch shall include areas specified by the ~~pre-fire site safety~~ plan established in accordance with Section 3308.3. ~~The fire watch personnel shall keep a record of all time periods of duty, including a log entry each time the site was patrolled and each time a structure under construction was entered and inspected. The records and log entries shall be made available for review by the fire code official upon request.~~3308.

3304.5.4 Fire Watch Records. Fire watch personnel shall keep a record of all time periods of duty, including the log entry each time the site was patrolled, and each time a structure was entered and inspected. Records shall be made available for review by the fire code official upon request.

3304.8 Cooking. Cooking shall be prohibited except in *approved* designated cooking areas separated from combustible materials by a minimum of ten feet. Signs with a minimum letter height of 3 inches (76 mm) and a minimum brush stroke of 1/2 inch (13 mm) shall be posted in conspicuous locations in designated cooking areas and state:
DESIGNATED COOKING AREA

COOKING OUTSIDE OF A DESIGNATED COOKING AREA IS PROHIBITED

3308.1 Program development and maintenance. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of ~~a~~an approved written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff, and staff training requirements. The plan shall be submitted and approved before a building permit is issued. Any changes to the plan shall be made available for review by the fire code official upon request. ~~submitted for approval.~~

Add new text as follows

3308.1.1 Components of Site Safety Plans. Site Safety Plans shall include the following as applicable:

1. Name and contact information of Site Safety Director
2. Documentation of the training of the Site Safety Director and fire watch personnel
3. Procedures for reporting emergencies
4. Fire Department Vehicle Access routes
5. Location of fire protection equipment including portable fire extinguishers, standpipes, fire department connections and fire hydrants.
6. Smoking and cooking policy, designated areas to be used when approved, and signage locations in accordance with 3304.8.
7. Location and safety considerations for temporary heating equipment
8. Hot work permit plan
9. Plans for control of combustibile waste material
10. Locations and methods for storage and use of flammable and combustibile liquids and other hazardous materials
11. Provisions for site security
12. Changes that affect this plan
13. Other site-specific information required by the Fire Code Official

Revise as follows

3308.2 ~~Program superintendent.~~Site Safety Director. The owner shall designate a person to be the fire prevention program superintendent who site safety director. The site safety director shall be responsible for the fire prevention program and ensure that it is carried out through completion of the project. The fire prevention program superintendent ensuring compliance with the site safety plan. The site safety director shall have the authority to enforce the provisions of this chapter and other provisions as necessary to secure the intent of this chapter. Where guard service is provided in accordance with NFPA 241, the superintendent site safety director shall be responsible for the guard service.

3308.3 ~~Prefire plans.~~Qualifications. The fire prevention program superintendent shall develop and maintain an approved prefire plan in cooperation with the fire chief. The fire chief and the fire code official shall be notified of changes affecting the utilization of information contained in such prefire plans. Site Safety Director shall acquire training specific to their roles and responsibilities. Upon request, the training and qualifications of the Site Safety Director shall be submitted to the Fire Code Official for approval.

3308.4 Training. Training of fire watch and other responsible personnel in the use of fire protection equipment shall be the responsibility of the fire prevention program superintendent. site safety director. Records of training shall be kept and made a part of the written plan for the fire prevention program. site safety plan.

3308.5 Fire protection devices. The fire prevention program superintendent shall determine. Site Safety Director shall ensure that all fire protection equipment is maintained and serviced in accordance with this code. The quantity and type of fire protection equipment shall be approved. Fire protection equipment shall be inspected in accordance with the fire protection program.

3308.5 Fire protection devices. The fire prevention program superintendent shall determine that all fire protection equipment is maintained and serviced in accordance with this code. The quantity and type of fire protection equipment shall be approved. Fire protection equipment shall be inspected in accordance with the fire protection program.

3308.6 Hot work operations. The fire prevention program superintendent shall be responsible for supervising the permit system for. Site Safety Director shall ensure hot work operations and permit procedures are in accordance with Chapter 35.

3308.7 Impairment of fire protection systems. ~~Impairments~~ The Site Safety Director shall ensure impairments to any fire protection system shall be are in accordance with Section 901.

3308.8 Temporary covering of fire protection devices. Coverings placed on or over fire protection devices to protect them from damage during construction processes shall be immediately removed upon the completion of the construction processes in the room or area in which the devices are installed.

501.3 Construction documents. *Construction documents* for proposed fire apparatus access, location of *fire lanes*, security gates across fire apparatus access roads and *construction documents* and hydraulic calculations for fire hydrant

systems shall be submitted to the fire department for review and approval prior to construction.

Add new text as follows

501.3.1 Site Safety Plan. The owner or owner's authorized agent shall be responsible for the development, implementation and maintenance of an approved written site safety plan in accordance with Section 3308.

SITE SAFETY PLAN

A plan developed to establish a fire prevention program at a construction site.

Reason: Fires in buildings under construction have, unfortunately, become routine. Fire departments across the United States are being stressed beyond their limits by these fires, and communities are being subjected to all of the negative consequences of losing major projects and draining fire protection resources. Virtually every national organization with a stake in this issue are wrestling with solutions. Part of the solution is to provide on-site safety supervision throughout the construction project. This code change will refine and clarify current requirements, and will require that the site safety plans be submitted with other construction documents in order to inform the building officials of their existence and their requirements. Specifically:

3304.5 This section has been reformatted for clarity.

3304.5.1 Makes a fire watch mandatory for buildings above 40 ft. in height or multi-story construction with an aggregate area exceeding 50,000 sq. ft. These buildings are large enough to create a significant loss to a community, endanger firefighters, and consume resources at an extraordinary rate if the building burns.

3304.5.2.1 maintains the requirement that the primary role of fire watch personnel is to watch for fires, but may also serve as security.

3305.2.2 Maintains current requirements for training fire watch personnel

3304.5.2.3 Requires the fire watch person to have a means to notify the fire department.

3304.8 introduces a requirement for separating the construction site from cooking operations.

3308.1 introduces a new requirement for the site safety plan to be submitted for approval before a building permit is issued. This is intended to highlight the importance of having a plan, and getting it into the hands of the inspectors before the building is actually under construction.

3308.1.1 outlines the content required for a site safety plan.

3308.2 simply changes the nomenclature from "fire prevention program superintendent" to "site safety director".

3308.3 requires the site safety director to be trained in the duties of the job

3308.4 updates the verbiage of the existing requirements

3308.5 updates the language and removes an ambivalent requirement for the "quantity and type of fire protection equipment" to be approved; it also removes language about inspecting the equipment because that is deemed to be redundant language

3308.6 inserts a reference to Chapter 35 for hot work and updates the language.

Section 501.3.1 is updated to require a site safety plan and place responsibility on the owner.

Finally, a definition for site safety plan is added.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

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

it's likely that this code change will have a minimal, but increased cost impact. Many construction sites already comply with these provisions; for those that don't, the cost of added security and development of a site safety plan will be additional costs.

F264-18

Public Hearing Results

Errata:

3304.5.2.2 Training. Personnel shall be trained in to serve as an on-site fire watch. Training shall include the use of portable fire extinguishers. Fire extinguishers and fire reporting shall be in accordance with Section 3309.

3304.5.3 Fire watch location and records. The fire watch shall include areas specified by the prefire site safety plan plan established in accordance with Section 3308.

~~3308.5.4~~ **3304.5.4 Fire Watch Records.** Fire watch personnel shall keep a record of all time periods of duty, including the log entry each time the site was patrolled, and each time a structure was entered and inspected. Records shall be made available for review by the fire code official upon request.

Committee Action:

As Submitted

Committee Reason: This proposal was approved as it was seen a good companion change to code change proposal F263-18. In addition, the term "site safety plan" was seen as better terminology than "pre-fire plan." It was agreed that requiring the site safety plan to be approved by the fire code official is necessary. Allowing security to be used for fire watch was seen as a good use of resources. (Vote: 14-0)

Assembly Action:

None

F264-18

Individual Consideration Agenda

Public Comment 1:

Proponent: John Catlett, representing BOMA International (jcatlett@boma.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

3308.1 Program development and maintenance. The owner or owner s authorized agent shall be responsible for the development, implementation and maintenance of an approved written site safety plan establishing a fire prevention program at the project site applicable throughout all phases of the construction, repair, alteration or demolition work. The plan shall address the requirements of this chapter and other applicable portions of this code, the duties of staff, and staff training requirements. The plan shall be submitted and approved before a building permit is issued, Any changes to the plan shall be submitted for approval. Where required by the fire code official, a pre-construction meeting shall be required before construction proceeds beyond the foundation.

Commenter's Reason: The code change adds necessary fire safety protection for construction projects. However, it stops short of one of the most important elements; communication. This public comment adds an important element that many fire code officials may have not considered. Having a pre-construction or post foundation permit conference to discuss the site safety plan allows for the direct communication to lay the ground rules and open communications for all parties to the safe building team. This is not a mandate for departments with limited staffing or resources. However, it brings in a concept found in the IEBC that promotes discussion and understanding of requirements.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction adding a meeting at the fire code officials request will not add to the cost of construction.

Public Comment 2:

Proponent: John Catlett, representing BOMA International (jcatlett@boma.org) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

3304.5.2 Fire watch personnel. Fire watch personnel shall be provided in accordance with this section. Buildings or campus facilities that employ twenty-four hour security, have an on-site police department, or that maintain an on-site fire department shall be approved by the fire code official where it has been demonstrated that they meet the requirements of this section and are able to perform the functions set out by this code.

Commenter's Reason: As the provisions are currently written, one would believe that the owner or their designee would be required to employ a separate and distinct fire watch or service when construction exceeds the thresholds established. Many large buildings, college and university campuses, large campus type manufacturing facilities, and similar establishments have on site security forces capable of serving as a fire watch. For example, Colonial Williamsburg located in Virginia has a dedicated police force responsible for all of the buildings and facilities that make up Colonial Williamsburg. As part of the site safety plan approval process, the fire code official can evaluate the capabilities of their staff to carry out the requirements of a fire watch and ability to adequately provide coverage. Many large buildings and manufacturing facilities provide the same. The added language provides clarity for these types of special operations without adding the additional cost of an outside fire watch.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The public comment may reduce the cost of construction because it may provide additional persons that can undertake the fire watch from the building or facility without having to pay outside personnel or the fire department.

Public Comment 3:

Proponent: Billie Zidek, APPA, representing APPA requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

3304.5 Fire watch. Where required by the *fire code official* or the site safety plan established in accordance with Section 3308.1, a fire watch shall be provided for building ~~demolition and~~ Type III and V building construction or for building construction that is hazardous in nature, such as temporary heating or hot work.

3304.5.1 Fire watch during construction. A fire watch shall be provided during nonworking hours for ~~new construction~~ construction defined in Section 3304.5 that is new and that exceeds 40 feet (12 192 mm) in height above the lowest adjacent grade at any point along the building perimeter, any new multi-story construction with an aggregate area exceeding 50,000 sq. ft. per story or as required by the fire code official. Unoccupied buildings under renovation or construction that have functioning fire alarm system as approved by the fire code official are exempt from this requirement.

3308.3 Qualifications. The Site Safety Director shall acquire training specific to their roles and responsibilities. Upon request, the training and qualifications of the Site Safety Director shall be submitted to the Fire Code Official ~~for approval~~.

Commenter's Reason: APPA applauds efforts to improve fire safety at the construction site. However, the emphasis for fire watches should be placed on Type III and V buildings and/or those where hot work and temporary heating is part of the construction. We have proposed recommended language in 3304.5.

The language in this proposal as currently written does not address buildings undergoing renovations or construction where existing fire alarm systems are functioning and active. Under such circumstances the need for a fire watch certainly does not exist. We have proposed recommended language in 3304.5.1 that would remove the Fire watch requirement under such conditions.

We also note that Section 3308.3 would require under F264-18 that Fire Code Officials approve the training and qualifications of the Site Safety Director, however, there is no description or explanation of the criteria used by the Fire Code Official to substantiate director training and qualifications. We recommend changes to the language that would still require the director's credentials to be submitted to fire code officials, but not for approval.

Cost Impact: The net effect of the public comment and code change proposal will decrease the cost of construction. These changes should partially reduce the increase in cost of construction that the original proposal would produce.

Public Comment 4:

Proponent: Tien Peng, representing National Ready Mixed Concrete Association (tpeng@nrmca.org) requests As Submitted.

Commenter's Reason: In a real, unexpected structural fire, at greater risk are people who cannot respond or evacuate in a timely manner people sleeping in their apartment homes, large groups of children, and the elderly. Evacuation of large buildings is more difficult because of lengthier evacuation routes. Further, fires in large buildings may present more difficult fire control problems because of inaccessibility to the more remote interior spaces of these extremely large R-Occupancies.

Even from the American Wood Council's own document, Basic Fire Precautions During Construction of Large Buildings highlight the need for concern: National fire organizations, including US Fire Administration and the National Fire Protection Association have been monitoring losses for construction fires in large buildings for decades. The trend and pattern of these fires is significant since it shows that a greater percentage of them result in large financial losses than fires in completed, occupied buildings.

if they were to follow their own recommendations, The Fire Safety Plan should identify the required security measures, which may include: Employing 24-hour security guards on larger sites with post orders that include recorded rounds, and supported by intrusion detection systems, and Site security cannot be underestimated. Observation of conditions after hours, and especially when there are abnormal weather conditions, is essential in reducing the possibility of fire. In view of the fact that arson is a significant contributor to fire loss on construction sites then security measures become very critical in protecting the site, certainly seems we are all in fact supportive of this proposal.

Bibliography: <https://constructionfiresafety.org/topics/basic-fire-precautions-during-construction-of-large-buildings>

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction Site security in off hours would be a cost but certainly offset by reduced safety risk and theft.

F264-18

F266-18

IFC: 3308.4

Proposed Change as Submitted

Proponent: Stephen DiGiovanni, representing ICC Ad Hoc Committee on Tall Wood Buildings (TWB) (TWB@iccsafe.org)

2018 International Fire Code

3308.4 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction. Buildings of Types IV-A, IV-B, and IV-C construction designed to be greater than six stories above grade plane shall comply with the following requirements during construction unless otherwise approved by the fire code official.

1. Standpipes shall be provided in accordance with Section 3313.
 2. A water supply for fire department operations, as approved by the fire chief.
 3. Where building construction exceeds six stories above grade plane, at least one layer of noncombustible protection where required by Section 602.4 of the International Building Code shall be installed on all building elements more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.
 4. Where building construction exceeds six stories above grade plane required exterior wall coverings shall be installed on all floor levels more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor level.
- Exception: Shafts and vertical exit enclosures.**

Reason: The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB has created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB has developed a number of proposals to potentially increase the permitted height and area for Type IV structures, specifically mass timber buildings adding additional Types IV-A, IV-B & IV-C. One of the basic requirements incorporated into these proposed increased heights and areas is the added active and passive protection features to these structures.

The goal of this proposal is to provide guidance and requirements for when this combustible building is most vulnerable, while under construction prior to fire protection systems have been installed.

Over the recent years we have experienced a number of fires while combustible buildings have been under construction. It is understood the vast majority of these fires did occur in structures of light-frame structural wood members which present a significant fire hazard when exposed. Even with this fact we cannot simply ignore the potential risk of fire in combustible construction simply due to the size of the timber element and the potentially longer period of time for ignition as the potentially fuel load of a mass timber building can be substantial.

The TWB had a great deal of discussion regarding the proposed requirements regarding water supply to the buildings of combustible construction sites. On one hand, there was a desire to establish a minimum water flow of 250 gpm with a minimum pressure. But the counter discussion identified that these combustible building construction sites may have various degrees of hazards on the site and was not restrictive to just the structure. Mass timber construction typically proceeds with little stored combustible material on the site, mass timber is generally installed as it arrives. Thus, there may be more or fewer site hazards than on a typical construction site utilizing combustible materials. Moreover, protection of the installed material must occur before the project moves above certain specified numbers of levels. This is very different from conventional construction processes.

With this understanding, the TWB is proposing project developers meet and confer with the local fire service to establish the fire department's response needs, in terms of water flow and pressure, for the specific building, while under construction, and job site.

While sub-sections 1 and 2 apply to the delivery of water to the job site, and/or structure, sub-sections 3 and 4 are specific to the passive protection related to the structure. Due to the proposed increased heights and areas, the TWB felt it was important to require interior and exterior passive protection as the construction progressed. This would insure the lower portions of the combustible structure had redundant, active and passive, protection as greater heights were added.

Two figures are shown below to illustrate the requirements of sub-sections 3 and 4 of this proposal. Since both buildings will exceed six-stories, protection must be provided during construction. The solid thick lines indicate building elements that are required to be protected. Solid thin lines indicate elements that are in-place, but are not required to be protected and dashed lines indicate elements that have not yet been placed. Figure 1 is shown to illustrate when protection is first required on a building under construction. When level 6 is the active level of mass timber construction, protection of the building elements and the exterior wall coverings are required before level 7 panels can be placed. In Figure 2, the progress of protection on each successive level is indicated as construction continues. In this example, level 14 is the active level of mass timber construction, so prior to placement of floor panels at level 15, protection is required on level 9.

New paragraph for the reason statement: Two figures are shown below to illustrate the requirements of sub-sections 3 and 4 of this proposal. Since both buildings will exceed six-stories, protection must be provided during construction. The solid thick lines indicate building elements that are required to be protected. Solid lines indicate elements that are in-place, but are not required to be protected and dashed lines indicate elements that have not yet been placed. Figure 1 is shown to indicate when protection is first required to be provided on a building under construction. When level 6 is the active level, protection of the building elements and the exterior wall coverings are required before level 7 panels can be placed. In Figure 2, the progress of protection on each successive level is indicated as construction continues. In this example, level 14 is the active level, so prior to placement of floor panels at level 15, protection is required on level 9.

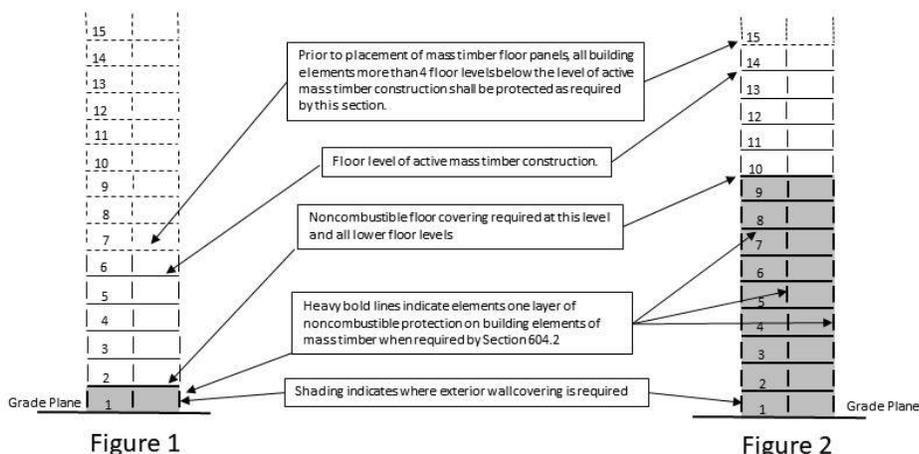


Figure 1

Figure 2

**Examples of Protection During Construction
For Mass Timber Buildings Greater Than
6 Stories Above Grade Plane**

The TWB strongly feels these code change proposals should be adopted as a whole package. By adopting a few of the code change proposals without the complete package potentially ignores the details required to insure these proposed projects are designed, built and maintained properly now and in the future. **Background information:** The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website <https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/> (link active and up to date as of 12/27/17). As seen in the "Meeting Minutes and Documents" and "Resource Documents" sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

IBC Code Section	Description
403.3.2	Water supply requirements for fire pumps in high rise buildings of Type IVA and IVB construction.
504.3	Allowable building height (feet) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT construction.
504.4	Allowable building height (stories) for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
506.2	Allowable building area for buildings of Type IVA, IVB and IVC construction. No changes to Type IV HT.
508.4.4.1 509.4.1.1 (new)	Requirements for mass timber building elements serving as fire barriers or horizontal assemblies in buildings of Type IVB or IVC construction.
602.4	Type of Construction requirements for new proposed types of construction: Types IVA, IVB and IVC. No changes to Type IV HT construction. Includes definitions for new terms: Mass timber and Noncombustible protection (mass timber). THIS IS THE KEY CODE CHANGE PROPOSAL WHICH OUTLINES THE CONSTRUCTION REQUIREMENTS FOR THE PROPOSED NEW TYPE OF MASS TIMBER BUILDINGS. THE PROPOSAL ALSO ADDRESSES CONCEALED SPACES, ADHESIVE PERFORMANCE AND EXTERIOR WALL PROTECTION.
703.8 (new)	The performance method to determine the increase to the fire resistance rating provided by noncombustible protection applied to the mass timber building element.
703.9 (new)	Requirements for sealants and adhesives to be placed at abutting edges and intersections of mass timber building elements. The reason statement references a Group B proposal to Chapter 17 for special inspection requirements of sealants and adhesives.
718.2.1	Requirements on the use of mass timber building elements used for Fireblocking.
722.7 (new)	Requirements for the fire resistance rating of mass timber elements, including minimum required protection and gypsum board attachment requirements.
3102	Requirements for membrane structures using Type IV HT construction.
3314.7 (new)	New special precautions during construction of buildings of Types IVA, IVB and IVC construction: Standpipes; Water supply for fire department connections; Noncombustible protection required for mass timber elements as construction height increases.
Appendix	Requirements for walls, floors and roofs of Type IV HT construction in buildings located in Fire Districts.
IFC Code Section	Description
701.6	Requirements which stipulate the owner's responsibility to maintain inventory of all required fire resistance rated construction in buildings of Types IVA and IVB construction. This includes an annual inspection and proper repair where necessary.
Proposed changes to be submitted in 2019 Group B	
IBC Chapter 17	Required special inspections of mass timber construction <ul style="list-style-type: none"> • Structural • Sealants and adhesives (see IBC 703.8)
IBC Chapter 23	An update to referenced standard APA PRG 320 Standard for Performance –rated Cross-laminated Timber which is currently undergoing revision to ensure the adequacy of the adhesives under fire conditions.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals, and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

F266-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 3308.4 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction. Buildings of Types IV-A, IV-B, and IV-C construction designed to be greater than six stories above grade plane shall comply with the following requirements during construction unless otherwise approved by the fire code official.

1. Standpipes shall be provided in accordance with Section 3313.
2. A water supply for fire department operations, as approved by the fire chief.
3. Where building construction exceeds six stories above grade plane, at least one layer of noncombustible protection where required by Section 602.4 of the International Building Code shall be installed on all building elements more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.

Exception: Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

4. Where building construction exceeds six stories above grade plane required exterior wall coverings shall be installed on all floor levels more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor level.

Exception: Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

Committee Reason: This proposal was approved as part of the tall wood building proposals and provides the necessary construction fire safety related provisions. The modification merely makes it clear as to how the exceptions are to apply. The intention is that they only affect items 3 and 4. Shafts and vertical exit enclosures are not constructed with CLT and are not considered when reviewing the progress of construction. (Vote: 13-0)

Assembly Action:

None

F266-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen DiGiovanni, representing Ad Hoc Committee for Tall Wood Buildings (sdigiovanni@clarkcountynv.gov) requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

3308.4 Fire safety requirements for buildings of Types IV-A, IV-B, and IV-C construction. Buildings of Types IV-A, IV-B, and IV-C construction designed to be greater than six stories above grade plane shall comply with the following requirements during construction unless otherwise approved by the fire code official.

1. Standpipes shall be provided in accordance with Section 3313.
2. A water supply for fire department operations, as approved by the fire code official and the fire chief.
3. Where building construction exceeds six stories above grade plane, at least one layer of noncombustible protection where required by Section 602.4 of the International Building Code shall be installed on all building elements more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor levels.

Exception: Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

4. Where building construction exceeds six stories above grade plane required exterior wall coverings shall be installed on all floor levels more than 4 floor levels, including mezzanines, below active mass timber construction before erecting additional floor level.

Exception: Shafts and vertical exit enclosures shall not be considered a part of the active mass timber construction.

Commenter's Reason: The original code change proposal was approved by the committee. However, during committee discussions, there was concern that Item 2, which discusses the water supply required for fire department operations during construction, should require also approval by the fire code official. There is concern that, with the many various ways that jurisdictions administer the fire code, not including the fire code official could be make the review and approval process awkward in some instances. This Public Comment simply adds the fire code official to Item 2, to satisfy this concern.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This section provides information that was not previously set forth in the code, and does not change the requirements of current code, thus there is no cost impact when compared with present requirements.

Public Comment 2:

Proponent: Dan Nichols, representing ICC Code Correlation Committee (ccc@iccsafe.org).

Commenter's Reason: The Code Correlation Committee (CCC) is not taking a position on this code change. The CCC submitted this public comment in order to bring a correlation issue to the attention of the full voting membership for the Public Comment Hearings and the Online Governmental Consensus Vote to allow the voting membership to coordinate actions on a package of code changes submitted dealing with tall wood buildings of mass timber construction. This package includes the parent proposal G108-18; if disapproved, the related proposals G28-18, G75-18, G80-18, G84-18, G89-18, FS5-18, FS6-18, FS73-18, FS81-18 and F266-18, will not be correlated with any existing code text if they are approved.

The Code Correlation Committee is a standing committee of the International Code Council whose objectives, procedures and organization are set forth in Council Policy CP#44-13. The objective of the Code Correlation Committee is to maintain technical and editorial consistency among the International Codes and to assist staff in the evaluation and processing of code change proposals and comments that are exclusively editorial.

F266-18

F267-18 Part I

IFC: SECTION 3318, 3318.1, 3318.1.1, 3318.1.2, NFPA

Proposed Change as Submitted

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

THIS IS A 2 PART CODE CHANGE PROPOSAL. PART I WILL BE HEARD THE IFC COMMITTEE, PART II WILL BE HEARD BY THE IBC-G COMMITTEE. PLEASE SEE THE TENTATIVE HEARING ORDERS FOR THE RESPECTIVE COMMITTEES.

2018 International Fire Code

Add new text as follows

SECTION 3318 PROTECTION OF COMBUSTIBLE CONSTRUCTION

3318.1 Fire safety requirements for buildings of Type III and V construction. Buildings of Types III and V construction designed to be four or more stories above grade plane shall meet the following requirements during construction unless otherwise approved by the fire official.

3318.1.1 Exposed interior combustible framing. Where portions of the building construction exceeds 40-feet in height above fire department vehicle access, exposed interior combustible framing members shall be protected during the construction process by a thermal barrier of 1/2-inch gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275 in accordance with Section 2603.4 of the International Building Code. Concealed spaces shall comply with Section 718 of the International Building Code.

The thermal barrier shall be installed on all exposed interior surfaces of combustible framing members below the 40-feet of height, including mezzanines, so that no more than two floors of combustible framing members for the building are exposed before erecting an additional floor level. When the building construction commences above the 40-feet of height, the thermal barrier shall be installed on all exposed interior combustible framing members, including mezzanines, so that a total of no more than one floor of combustible framing members for the building is exposed on the interior before erecting an additional floor level.

3318.1.2 Exposed exterior combustible framing. Where portions of the building construction exceeds 40-feet above fire department vehicle access, including mezzanines, exposed exterior combustible framing members below the 40-feet of height, shall be covered by a noncombustible material or exterior wall covering in accordance with Section 1404 of the International Building Code so that no more than two floors of exterior combustible framing are exposed before erecting additional floor levels. The noncombustible material or exterior wall covering shall continue to be installed on all exposed exterior combustible framing above the 40-feet of height, including mezzanines, so that a total of no more than one floor of combustible framing members are exposed on the exterior before erecting additional floor levels.

Add new standard(s) follows

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

275—17:

Standard Method of Fire Tests for the Evaluation of Thermal Barriers

Analysis: A review of the standard proposed for inclusion in the code, NFPA 275-17, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

Reason: As light wood frame buildings of Type III and V construction continue to be built to large heights and areas as allowed in Tables 504.3, 504.4 and 506.2 of the code, there has been a notable increase in fires, especially for Group R2 Residential Occupancies constructed of combustible framing, while the building is under construction. This has resulted in 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 are not 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. An example is the 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 Freeway (Hwy 110) 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 buildings as well. The glazing in hundreds of windows of a nearby building was also damaged.

There are numerous examples of other large combustible framed apartment and condominium building that experienced significant fires and damage while the building was under construction that illustrate the fire risk these large buildings pose. The following is a list of six such incidences in 2017. This list is not necessarily inclusive of all similar large combustible building fires in 2017 while under construction.

1. Metropolitan Apartments, Raleigh NC March 17, 2017- 5-story apartments on concrete podium.
2. The Royale at City Place, Overland Park, KS March 20, 2017 - 5-story apartments
3. Fuse 47, College Park, MD April 24, 2017 - 5-story apartments on concrete podium.
4. Treadmark, Boston MA, June 28, 2017 - 6-story condominiums
5. Kelowna, BC, Canada July 8, 2017 - 6-story apartments on concrete podium
6. Edison on the Charles, Waltham, MA July 23, 2017 - 5-story apartments

The goal of this proposal is to provide guidance and requirements for protection when this combustible building is most vulnerable, while under construction and prior to passive and active fire protection being installed. Recently the ICC Tall Wood Building Ad Hoc Committee discussed similar fire protection measures for Mass Timber Buildings under construction. The TWB Committee recognized the risks associated with taller buildings of combustible construction and the hazards they pose for fire department exterior and interior attack tactics

To reduce the risk of these construction fires this proposal will require the exposed combustible framing members be covered with a thermal barrier on the inside of the building and the planned exterior wall covering on the outside. The thermal barrier protection is similar to the requirements for exposed foam plastic insulation (a combustible material) in 2603.4. If combustible framing should be ignited during construction both the thermal barrier and the exterior wall coverings reduce exposure of other combustible materials from the fire incident.

The passive protection should be provided when the construction reaches the 40-foot height above the fire department vehicle access. The 40-foot threshold is consistent with the threshold when standpipes for construction are required by 3311.1. These levels of fire protection are consistent with the fire risks associated with these larger buildings of combustible construction, and upon which the building code provisions are based. Also, like the standpipe requirements, the passive protection must be extended as each floor is added.

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

This proposal is expected to increase the cost of construction due to the passive fire protection 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.

Analysis: The referenced standard, NFPA 275-17, is currently referenced in other 2018 I-codes.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: Although the intent of the proposal was clear it would be cost prohibitive to require this level of protection during construction. The provisions are too broadly applied to smaller buildings. Finally, this proposal would require protection from rain and snow to allow this concept to work in most cases which is not practical. The revisions in code change proposals F263-18 and F264-18 were preferred over this proposal.(Vote: 14-0)

Assembly Action:

None

F267-18 Part I

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Skalko, representing Alliance for Concrete Codes and Standards (svskalko@svskalko-pe.com); William Hall, Alliance for Concrete Codes and Standards, representing Alliance for Concrete Codes and Standards (jhall@cement.org)requests As Submitted.

Commenter's Reason: G267-18 should be Approved as Submitted. This action is based on the evidence of construction fires involving Types III and V buildings.

According to the National Fire Protection Association report, *Large-Loss Fires in the United States 2016*, (Stephen Badger, November 2017), there were five large loss fires involving apartments and a hotel under construction. These five fires resulted in about \$67 million dollars in losses and affected not only the buildings in question, but in several cases, fire spread to adjoining properties and destroyed other buildings.

The NFPA report has not been released for 2017 but, based on the six fires involving buildings under construction listed in the reason statement in support of F267-18, it is likely this trend will continue. This will be due in part because the fires in the NFPA 2016 report have similar characteristics to the ones listed for 2017 namely the buildings in 2016 were under construction and some involved unprotected wood frame construction.

It is important that corrective measures be taken now to eliminate this deficiency in the building and fire code regarding buildings of Type III and V under construction. The question is not one of practicality but of safety to the public and the fire service and the reduction of property losses due to these types of fires. Though it may require changes to construction methods and increase the cost of construction, the trend based on the fire incidences occurring with regularity for these types of buildings is apparent.

Recommend APPROVAL AS SUBMITTED for F267-18

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This proposal is expected to increase the cost of construction due to the passive fire protection 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.

F267-18 Part I

F267-18 Part II

IBC: SECTION 3314, 3314.1 , 3314.1.1, 3314.1.2

Proposed Change as Submitted

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com); William Hall, Portland Cement Association, representing Alliance For Concrete Codes and Standards (jhall@cement.org)

2018 International Building Code

Add new text as follows

SECTION 3314 PROTECTION OF COMBUSTIBLE CONSTRUCTION

3314.1 Fire safety requirements for buildings of Type III and V construction. Buildings of Types III and V construction designed to be four or more stories above grade plane shall meet the following requirements during construction unless otherwise approved by the fire official.

3314.1.1 Exposed interior combustible framing. Where portions of the building construction exceeds 40-feet in height above fire department vehicle access, exposed interior combustible framing members shall be protected during the construction process by a thermal barrier of 1/2-inch gypsum wallboard or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275 in accordance with Section 2603.4. Concealed spaces shall comply with Section 718.

The thermal barrier shall be installed on all exposed interior surfaces of combustible framing members below the 40-feet of height, including mezzanines, so that no more than two floors of combustible framing members for the building are exposed before erecting an additional floor level. When the building construction commences above the 40-feet of height, the thermal barrier shall be installed on all exposed interior combustible framing members, including mezzanines, so that a total of no more than one floor of combustible framing members for the building is exposed on the interior before erecting an additional floor level.

3314.1.2 Exposed exterior combustible framing. Where portions of the building construction exceeds 40-feet above fire department vehicle access, including mezzanines, exposed exterior combustible framing members below the 40-feet of height, shall be covered by a noncombustible material or exterior wall covering in accordance with Section 1404 so that no more than two floors of exterior combustible framing are exposed before erecting additional floor levels. The noncombustible material or exterior wall covering shall continue to be installed on all exposed exterior combustible framing above the 40-feet of height, including mezzanines, so that a total of no more than one floor of combustible framing members are exposed on the exterior before erecting additional floor levels.

Reason: As light wood frame buildings of Type III and V construction continue to be built to large heights and areas as allowed in Tables 504.3, 504.4 and 506.2 of the code, there has been a notable increase in fires, especially for Group R2 Residential Occupancies constructed of combustible framing, while the building is under construction. This has resulted in 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 are not 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. An example is the 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 Freeway (Hwy 110) 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 buildings as well. The glazing in hundreds of windows of a nearby building was also damaged.

There are numerous examples of other large combustible framed apartment and condominium building that experienced significant fires and damage while the building was under construction that illustrate the fire risk these large buildings pose. The following is a list of six such incidences in 2017. This list is not necessarily inclusive of all similar large combustible building fires in 2017 while under construction.

1. Metropolitan Apartments, Raleigh NC March 17, 2017- 5-story apartments on concrete podium.
2. The Royale at City Place, Overland Park, KS March 20, 2017 - 5-story apartments
3. Fuse 47, College Park, MD April 24, 2017 - 5-story apartments on concrete podium.
4. Treadmark, Boston MA, June 28, 2017 - 6-story condominiums
5. Kelowna, BC, Canada July 8, 2017 - 6-story apartments on concrete podium
6. Edison on the Charles, Waltham, MA July 23, 2017 - 5-story apartments

The goal of this proposal is to provide guidance and requirements for protection when this combustible building is most vulnerable, while under construction and prior to passive and active fire protection being installed. Recently the ICC Tall Wood Building Ad Hoc Committee discussed similar fire protection measures for Mass Timber Buildings under construction. The TWB Committee recognized the risks associated with taller buildings of combustible construction and the hazards they pose for fire department exterior and interior attack tactics

To reduce the risk of these construction fires this proposal will require the exposed combustible framing members be covered with a thermal barrier on the inside of the building and the planned exterior wall covering on the outside. The thermal barrier protection is similar to the requirements for exposed foam plastic insulation (a combustible material) in 2603.4. If combustible framing should be ignited during construction both the thermal barrier and the exterior wall coverings reduce exposure of other combustible materials from the fire incident.

The passive protection should be provided when the construction reaches the 40-foot height above the fire department vehicle access. The 40-foot threshold is consistent with the threshold when standpipes for construction are required by 3311.1. These levels of fire protection are consistent with the fire risks associated with these larger buildings of combustible construction, and upon which the building code provisions are based. Also, like the standpipe requirements, the passive protection must be extended as each floor is added.

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

This proposal is expected to increase the cost of construction due to the passive fire protection 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.

F267-18 Part II

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This is a problem that needs a solution, but this is not it. It is a significant change to construction methods. Not sure how this would work with light frame construction. The moisture issue is significant and need to be addressed. The comparison of light frame wood construction to mass timber construction is incorrect. There is a need to address construction fires in all construction types, and especially wood construction. There are other proposals that may better address these concerns. A dry wall crew would have to continuously come in and out of the job site. This would substantially increase the cost of construction. (Vote: 14-0)

Assembly Action:

None

F267-18 Part II

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Skalko, representing Alliance for Concrete Codes and Standards (svskalko@svskalko-pe.com); William Hall, Alliance for Concrete Codes and Standards, representing Alliance for Concrete Codes and Standards (jhall@cement.org) requests As Submitted.

Commenter's Reason: G267-18 should be Approved as Submitted. This action is based on the reasons given by the General Committee in their disapproval. The General Committee acknowledged there is a problem and a need to address construction fires and especially wood construction. Based on the evidence of construction fires involving Types III and V buildings we concur.

According to the National Fire Protection Association report, *Large-Loss Fires in the United States 2016*, (Stephen Badger, November 2017), there were five large loss fires involving apartments and a hotel under construction. These five fires resulted in about \$67 million dollars in losses and affected not only the buildings in question, but in several cases, fire spread to adjoining properties and destroyed other buildings.

The NFPA report has not been released for 2017 but, based on the six fires involving buildings under construction listed in the reason statement in support of F267-18, it is likely this trend will continue. This will be due in part because the fires in the NFPA 2016 report have similar characteristics to the ones listed for 2017 namely the buildings in 2016 were under construction and some involved unprotected wood frame construction.

It is important that corrective measures be taken now to eliminate this deficiency in the building and fire code regarding buildings of Type III and V under construction. Though it may require changes to construction methods and increase the cost of construction, the trend based on the fire incidences occurring with regularity for these types of buildings is apparent.

Recommend APPROVAL AS SUBMITTED for F267-18

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This proposal is expected to increase the cost of construction due to the passive fire protection 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.

F267-18 Part II

F270-18

IFC: 3314.1; IBC: 3312.1; IEBC: 1507.1

Proposed Change as Submitted

Proponent: Stephen Skalko, Stephen V. Skalko, P.E. & Associates, LLC, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com)

2018 International Fire Code

Add new text as follows

3314.1 Completion during construction. Where an automatic sprinkler system is required by this code in buildings of Type III or V construction, and will be 4 or more stories above grade plane, the portion of the building or structure that is more than 40-feet in height above fire department vehicle access shall not begin construction until automatic sprinkler protection, either temporary or permanent, is provided for all stories below. As construction progresses such automatic sprinkler protection shall be extended to within one floor of the highest point of construction having secured decking or flooring.

2018 International Building Code

3312.1 Completion during construction. Where an automatic sprinkler system is required by this code in buildings of Type III or V construction, and will be 4 or more stories above grade plane, the portion of the building or structure that is more than 40-feet in height above fire department vehicle access shall not begin construction until automatic sprinkler protection, either temporary or permanent, is provided for all stories below. As construction progresses such automatic sprinkler protection shall be extended to within one floor of the highest point of construction having secured decking or flooring.

2018 International Existing Building Code

1507.1 Completion during construction. Where an automatic sprinkler system is required by this code in buildings of Type III or V construction, and will be 4 or more stories above grade plane, the portion of the building or structure that is more than 40-feet in height above fire department vehicle access shall not begin construction until automatic sprinkler protection, either temporary or permanent, is provided for all stories below. As construction progresses such automatic sprinkler protection shall be extended to within one floor of the highest point of construction having secured decking or flooring.

Reason: Automatic sprinkler protection systems continue to be the major factor that permits buildings to be built to larger heights and areas as allowed in Tables 504.3, 504.4 and 506.2 of the code. With these increases there has been a notable increase in fires, especially for Group R2 Residential Occupancies constructed of combustible framing, 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 are not 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. An example is the 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 Freeway (Hwy 110) 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.

There are numerous examples of other large combustible framed apartment and condominium building fires while the building was under construction that illustrate the fire risk these large buildings pose. The following is a list of six such incidences in 2017. This list is not necessarily inclusive of all similar large combustible building fires in 2017.

1. Metropolitan Apartments, Raleigh NC March 17, 2017- 5-story apartment on pedestal

2. The Royale at City Place, Overland Park, KS March 20, 2017 – 5-story apartments
3. Fuse 47, College Park, MD April 24, 2017 – 5-story apartment on pedestal
4. Treadmark, Boston MA, June 28, 2017 – 6-story condominiums
5. Kelowna, BC, Canada July 8, 2017 – 6-story apartments
6. Edison on the Charles, Waltham, MA July 23, 2017 – 5-story apartments

Section 3311.1 of the code requires at least one 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 sprinkler protection, either temporary or permanent, be provided when the construction reaches the 40-foot height above the fire department vehicle access. This level of fire protection is consistent with the fire risks associated with these larger buildings of combustible construction, and upon which the building code provisions are based. Also, like the standpipe requirements, the sprinkler system must be extended as each floor is provided with decking or flooring.

Cost Impact: The code change proposal 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.

Analysis: The topic covered in this proposal is scoped to the IFC Code Development committee and therefore have been added to correlate in the duplicated sections within the IBC and IEBC.

F270-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This concept was felt to be impractical and costly for wood construction. In addition, there would be concern for requiring such protection for colder climates. The temporary sprinkler systems would be an added modification that would need to be removed later. Also, there was some concern that the temporary measures used for sprinkler activation may create a false sense of security of the effectiveness of such systems. (Vote: 14-0)

Assembly Action:

None

F270-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Stephen Skalko, representing Masonry Alliance for Codes and Standards (svskalko@svskalko-pe.com)requests As Submitted.

Commenter's Reason: G270-18 should be Approved as Submitted. This action is based on the evidence of construction fires involving Types III and V buildings.

According to the National Fire Protection Association report, *Large-Loss Fires in the United States 2016*, (Stephen Badger, November 2017), there were five large loss fires involving apartments and a hotel under construction. These five fires resulted in about \$67 million dollars in losses and affected not only the buildings in question, but in several cases, fire spread to adjoining properties and destroyed other buildings.

The NFPA report has not been released for 2017 but, based on the six fires involving buildings under construction listed in the reason statement in support of F267-18, it is likely this trend will continue. This will be due in part because the fires in the NFPA 2016 report have similar characteristics to the ones listed for 2017 namely the buildings in 2016 were under construction and some involved unprotected wood frame construction. In addition, in most cases the fire protection system was not installed yet or operational.

It is important that corrective measures be taken now to eliminate this deficiency in the building and fire code regarding buildings of Type III and V under construction. The question is not one of practicality or cost, as indicated by the Committee, but of safety to the public and the fire service and the reduction of property losses due to these types of fires. In addition, the technology exists to provide sprinkler systems where exposed to cold climates and subject to freezing conditions. Though it may require changes to construction methods or scheduling of sprinkler installations, and increase the cost of construction, the trend based on the fire incidences occurring with regularity for these types of buildings is apparent and necessitates such actions during construction.

Recommend APPROVAL AS SUBMITTED for F270-18

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. This proposal is expected to increase the cost of construction due to the active fire 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.

F270-18

F276-18

IBC: 307.1.1, 311.2, 311.3;

IFC: 903.2.4.2 (New) (IBC:[F]903.2.4.2), 903.2.9.3 (New) (IBC:[F]903.2.9.3), Chapter 40 (New), 5001.1, 5701.2

IMC: [F] 502.9.5

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org); Ed Kulik, Chair, representing ICC Building Code Action Committee (bcac@iccsafe.org)

2018 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).
6. Liquor stores and distributors without bulk storage.
7. Refrigeration systems.
8. The storage or utilization of materials for agricultural purposes on the premises.
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 product 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.
16. Capacitor energy storage systems in accordance with the International Fire Code.
17. Group B higher education laboratory occupancies complying with Section 428 and Chapter 38 of the International Fire Code
18. Distilling or brewing of beverages conforming to the requirements of the International Fire Code.
19. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the International Fire Code.

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are not classified as Group S-2, including, but not limited to, storage of the following:

Aerosol products, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
Beverages: over 16-percent alcohol content
Books and paper in rolls or packs
Boots and shoes
Buttons, including cloth covered, pearl or bone
Cardboard and cardboard boxes
Clothing, woolen wearing apparel
Cordage
Dry boat storage (indoor)
Furniture
Furs
Glues, mucilage, pastes and size
Grains
Horns and combs, other than celluloid
Leather
Linoleum
Lumber
Motor vehicle repair garages complying with the maximum allowable quantities of hazardous materials listed in Table 307.1(1) (see Section 406.8)
Photo engravings
Resilient flooring
Self-service storage facility (mini-storage)
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

311.3 Low-hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of noncombustible materials such as products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products are permitted to have a negligible amount of plastic *trim*, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of the following:

Asbestos
Beverages up to and including 16-percent alcohol ~~in metal, glass or ceramic containers~~
Cement in bags
Chalk and crayons
Dairy products in nonwaxed coated paper containers
Dry cell batteries
Electrical coils
Electrical motors
Empty cans
Food products
Foods in noncombustible containers
Fresh fruits and vegetables in nonplastic trays or containers
Frozen foods
Glass
Glass bottles, empty or filled with noncombustible liquids
Gypsum board
Inert pigments
Ivory
Meats
Metal cabinets
Metal desks with plastic tops and *trim*
Metal parts
Metals
Mirrors
Oil-filled and other types of distribution transformers
Parking garages, open or enclosed
Porcelain and pottery
Stoves
Talc and soapstones
Washers and dryers

2018 International Fire Code

Add new text as follows

903.2.4.2 Group F-1 Distilled Spirits. An automatic sprinkler system shall be provided throughout a Group F-1 fire area used for the manufacture of distilled spirits.

903.2.9.3 Group S-1 Distilled spirits or wine. An automatic sprinkler system shall be provided throughout a Group S-1 fire area used for the bulk storage of distilled spirits or wine.

CHAPTER **40 STORAGE OF DISTILLED SPIRITS AND WINES**

SECTION 4001 GENERAL

4001.1 General. The storage of distilled spirits and wines in barrels and casks shall comply with this chapter in addition to other applicable requirements of this code.

4001.1.1 Nonapplicability. Chapter 50 and Chapter 57 of this code are not applicable to the storage of distilled spirits and wines in barrels and casks as identified in Section 5001.1, Exception 10, and Section 5701.2, Item 10.

SECTION 4002 DEFINITIONS

4002.1 Terms defined in Chapter 2. Words and terms used in this chapter and defined in Chapter 2 shall have the meanings ascribed to them as defined therein.

SECTION 4003 PRECAUTIONS AGAINST FIRE

4003.1 Spill Control. Drainage or containment systems shall be provided by means of curbs, scuppers, special drains, or other suitable means to prevent the flow of spills throughout the building.

4003.2 Ventilation. Ventilation shall be provided for rooms and spaces where distilled spirits and wines in barrels and

casks are stored in accordance with the International Mechanical Code and one of the following:

1. The rooms and spaces shall be ventilated at a rate sufficient to maintain the concentration of vapors within the area at or below 25% of the LFL. This shall be confirmed by sampling of the actual vapor concentration under normal operating conditions. The sampling shall be conducted throughout the enclosed storage area extending to or toward the bottom and the top of the enclosed storage area. The vapor concentration used to determine the required ventilation rate shall be the highest measured concentration during the sampling procedure. The sampling shall be conducted manually or by installation of a continuously monitoring flammable vapor detection system.
2. The rooms and spaces shall be provided exhaust ventilation at a rate of not less than 1 cfm/ft² (0.3 m³/min) of solid floor area. The exhaust ventilation shall be accomplished by natural or mechanical means, with discharge of the exhaust to a safe location outside the building.

4003.3 Sources of ignition.. Sources of ignition shall be controlled in accordance with Sections 4003.3.1 through 4003.4.

4003.3.1 Smoking. Smoking shall be prohibited and "No Smoking" signs provided as follows:

1. In rooms or areas where hazardous materials are stored or dispensed or used in open systems in amounts requiring a permit in accordance with Section 105.6 and 105.7
2. Within 25 feet (7620mm) of outdoor storage, dispensing or open use areas.
3. Facility or areas within facilities that have been designated as totally "no smoking" shall have "No Smoking" signs placed at all entrances to the facility or area. Designated areas within such facilities where smoking is permitted either permanently or temporarily shall be identified with signs designating that smoking is permitted in these areas only.
4. In rooms or areas where flammable or combustible hazardous materials are stored, dispensed or used.

Signs required by this section shall be in English as a primary language or in symbols allowed by this code and shall comply with Section 310.

4003.3.2 Open Flame. Open flames and high-temperature devices shall not be used in a manner that creates a hazardous condition and shall be listed for use with the hazardous materials stored or used.

4003.3.3 Industrial trucks. Powered industrial trucks used in areas designated as hazardous (classified) locations in accordance with NFPA 70 shall be listed and labeled for use in the environment intended in accordance with NFPA 505.

4003.3.4 Electrical. Electrical wiring and equipment shall be installed and maintained in accordance with Section 605 and NFPA 70.

4003.4 Lightning. Structures containing barrel storage should be protected from lightning. The lightning protection equipment shall be installed in accordance with NFPA 780 and NFPA 70.

SECTION 4004 STORAGE

4004.1 Storage. Storage shall be in accordance with this section and Section 315.

4004.2 Empty containers. The storage of empty containers previously used for the storage of flammable or combustible liquids, unless free from explosive vapors, shall be stored as required for filled containers.

4004.3 Basement storage. Class I liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity over control area for use-open systems in Table 5003.1.1(1), provided that automatic suppression and other fire protection are provided in accordance with Chapter 9. Class II and IIIA liquids shall also be allowed to be stored in basements, provided that automatic suppression and other fire protection are provided in accordance with Chapter 9.

4004.4 Bulk beverage storage areas. There shall be no storage of combustible materials in the bulk beverage storage areas not related to the beverage storage activities.

SECTION 4005 FIRE PROTECTION

4005.1 Automatic sprinkler system. The storage of distilled spirits and wines shall be protected by an approved automatic sprinkler system as required by Chapter 9.

4005.2 Portable Fire Extinguishers. Approved portable fire extinguishers shall be provided in accordance with Section 906.

SECTION 4006 SIGNAGE

4006.1 Hazard identification signs. Unless otherwise exempted by the fire code official, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary containers and above ground tanks and at entrances to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the fire code official.

4006.1.1 Maintenance and style. Signs and markings required by Section 4006.1 shall not be obscured or removed, shall be in English as a primary language or in symbols allowed by this code, shall be durable, and the size, color, and lettering shall be approved.

Revise as follows

5001.1 Scope. Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials shall be in accordance with this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where specific requirements are provided in other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple hazards, all hazards shall be addressed.

Exceptions:

1. In retail or 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 and 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 (5 L).
2. Quantities of alcoholic beverages in retail or wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Application and release of pesticide and agricultural products and materials intended for use in weed abatement, erosion control, soil amendment or similar applications where applied in accordance with the manufacturers' instructions and label directions.
4. The off-site transportation of hazardous materials where in accordance with Department of Transportation (DOTn) regulations.
5. Building materials not otherwise regulated by this code.
6. Refrigeration systems (see Section 605).
7. Stationary storage battery systems regulated by Section 1206.2.
8. The display, storage, sale or use of fireworks and *explosives* in accordance with Chapter 56.
9. *Corrosives* utilized in personal and household products in the manufacturers' original consumer packaging in Group M occupancies.
10. The storage of ~~beer~~, distilled spirits and wines in ~~wooden~~ barrels and casks.
11. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids where in accordance with Section 5705.5.

5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including:

1. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23.
2. Medicines, foodstuffs, cosmetics and commercial or institutional products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L).
3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L).
4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 603. For abandonment of fuel oil tanks, this chapter applies.
5. Refrigerant liquids and oils in refrigeration systems (see Section 605).
6. Storage and display of aerosol products complying with Chapter 51.
7. Storage and use of liquids that do not have a fire point when tested in accordance with ASTM D92.
8. Liquids with a *flash point* greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion.
9. Liquids without *flash points* that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons.
10. The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.
11. Commercial cooking oil storage tank systems located within a building and designed and installed in accordance with Section 608 and NFPA 30.

Add new standard(s) follows

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

780-17:

Standard f or the Installation of Lightning Protection Systems

2018 International Mechanical Code

Revise as follows

[F] 502.9.5 Flammable and combustible liquids. Exhaust ventilation systems shall be provided as required by Sections 502.9.5.1 through 502.9.5.5 for the storage, use, dispensing, mixing and handling of flammable and combustible liquids. Unless otherwise specified, this section shall apply to any quantity of flammable and combustible liquids.

Exception-Exceptions:

1. This section shall not apply to flammable and combustible liquids that are exempt from the International Fire Code.
2. The storage of beer, distilled spirits and wines in barrels and casks conforming to the requirements of the International Fire Code.

Reason: Currently, due to changes over several code change cycles, there is confusion on how to treat distilled spirits in Building Code and for applicable safety requirements of the International Fire Code. Coordination between the codes on thi spirits still have the properties of flammable liquids and proper safeguards must be provided for the occupancies housing **[F] COMBUSTIBLE LIQUID.** A liquid having a closed cup flash point at or above 100°F (38°C). Combustible liquids shall be su

Class II. Liquids having a closed cup flash point at or above 100°F (38°C) and below 140°F (60°C).

Class IIIA. Liquids having a closed cup flash point at or above 140°F (60°C) and below 200°F (93°C).

Class IIIB. Liquids having a closed cup flash point at or above 200°F (93°C).

The category of combustible liquids does not include compressed gases or cryogenic fluids.

[F] FLAMMABLE LIQUID. A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categori
The Class I category is subdivided as follows:

Class IA. Liquids having a flash point below 73°F (23°C) and a boiling point below 100°F (38°C).

Class IB. Liquids having a flash point below 73°F (23°C) and a boiling point at or above 100°F (38°C).

Class IC. Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C). The category of flammable liquids does not include cryogenic fluids.

Image-1-Alcohol-Levels



Image-2-Alcohol-Levels



The International Building Code classifies the various activities into Groups. The manufacturing of beverages with over 16 percent alcohol is classified as an F-2; the manufacturing of beverages 16 percent alcohol or less is classified as an F-2.

306.2 Moderate-hazard factory industrial, Group F-1. Factory industrial uses that are not classified as Factory Industrial F Moderate Hazard and shall include, but not be limited to, the following:

Beverages: over 16-percent alcohol content

306.3 Low-hazard factory industrial, Group F-2. Factory industrial uses that involve the fabrication or manufacturing of not finishing, packing or processing do not involve a significant fire hazard shall be classified as F-2 occupancies and shall include,

Beverages: up to and including 16-percent alcohol content

The storage of beverages with up to and including 16-percent alcohol in metal, glass or ceramic containers is classified as

311.3 Low -hazard storage, Group S-2. Storage Group S-2 occupancies include, among others, buildings used for the storage of products on wood pallets or in paper cartons with or without single thickness divisions; or in paper wrappings. Such products include plastic trim, such as knobs, handles or film wrapping. Group S-2 storage uses shall include, but not be limited to, storage of

Beverages up to and including 16-percent alcohol in metal, glass or ceramic containers

However, there is no Group S classification listed for storage of beverages with over 16 percent alcohol and there are no distilling activities or bulk storage of distilled spirits in Section 307 High Hazard Group H.

311.2 Moderate-hazard storage, Group S-1. Storage Group S-1 occupancies are buildings occupied for storage uses that are but not limited to, storage of the following:

???

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the IBC

6. Liquor stores and distributors without bulk storage.

The lack of a S-1 Group designation for storage activities for beverages over 16-percent alcohol or any bulk storage recognized "Uses other than Group H" causes disputes between code officials as to application of a Group H to storage of the finished process.

In the International Fire Code there is confusion about the applicability of Chapter 50 Hazardous Materials-General Provisions Combustible Liquids provisions to distilled spirits because of the exception for distilled spirits and wines stored in wooden barrels. The issue is arising because of the growing popularity of "boutique" or "craft" distillers.

A review of the International Fire Code Commentary concerning the distilled spirits in wooden barrels exception finds the conflict between the codes:

5001.1 Scope.

Prevention, control and mitigation of dangerous conditions related to storage, dispensing, use and handling of hazardous materials in this chapter.

This chapter shall apply to all hazardous materials, including those materials regulated elsewhere in this code, except that where other chapters, those specific requirements shall apply in accordance with the applicable chapter. Where a material has multiple requirements addressed.

Exceptions:

10. The storage of distilled spirits and wines in wooden barrels and casks.

IFC Commentary:

"Exception 10 covers the storage of distilled spirits and wines in wooden barrels and casks. This statement may appear to exclude from being a Group H occupancy. However, the IBC will still classify the storage area as a Group H occupancy if the amounts (MAQs) per control area listed in Table 307.1(1) of that code for flammable or combustible liquids. All requirements for a Group H occupancy are applicable; however, any requirements from the code (fire code) are not."

5701.1 Scope and application. Prevention, control and mitigation of dangerous conditions related to storage, use, dispensing of combustible liquids shall be in accordance with Chapter 50 and this chapter.

5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters.

10. The storage of distilled spirits and wines in wooden barrels and casks.

IFC Commentary:

"Item 10 makes the storage of distilled spirits and wines in wooden barrels and casks exempt from this chapter. Although these liquids, the containers do not pose the rupture hazard that other containers do. Barrels and casks will leak their contents and that secure the staves expand and loosen. Even this hazard feature is generally mitigated by the operation of automatic spiriting progressing to the point where the metal bands get hot enough to expand. A similar exception also appears in Section 5001.1

In summary, when you manufacture distilled spirits you are an F-1 occupancy. When you manufacture wine or beer you are an S-2 occupancy. When you store distilled spirits in retail packaging you are not an H occupancy but when you store any beverage with over 16% alcohol in bulk, (includes some wines), you have an H occupancy. As far as risk goes, manufacturing of distilled spirits is an F-1 regardless of amount but an H if stored in bulk. This may be the case for the IFC, if you store your distilled spirits in bulk in wooden barrels Chapter 50 and 57 do not apply so there are no code

This proposal attempts to address this confusion recognizing the main safety issues are the need for automatic fire suppression and need for containment of spills. In 2005 the Distilled Spirits Council of The United States (DISCUS) released guidelines for facilities which addressed fire protection, ventilation and secondary containment requirements. Those guidelines were proposed for the International Fire Code.

It is proposed to make the following Group designation changes to the International Building Code:

Add a classification under S-1 for storage of beverages over 16% alcohol whether in bulk or retail packaging.

Modify the classification under S-2 to apply to all beverages up to and including 16-percent alcohol regardless of container

Modify Section [F] 307.1.1 "Uses other than Group H" to add classifications for distilling, brewing or storage of these materials

In the International Fire Code, it is proposed to strike the word "wooden" and addition of the "word beer" in the exceptions in

10. The storage of beer, distilled spirits and wines in ~~wooden~~ barrels and casks.

In the International Mechanical Code it is proposed to strike the word "wooden" from Section [F] 502.9.5 "Flammable and combustible

In conjunction with the Group classification cleanup and striking the word wooden in both the IFC and IMC, protection feature sprinkler thresholds for the manufacture of distilled spirits or bulk storage of distilled spirits regardless of square footage the International Fire Code for the Storage of Distilled Spirits and Wines.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC) and the ICC Building Code Action Committee (BCAC) Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2017 the Fire-CA there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>. BCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2017 the BCAC has held 3 open numerous Working Group meetings and conference calls for the current code development cycle, which included members interested party to discuss and debate the proposed changes. Related documentation and reports are posted on the BCAC website at: <https://www.iccsafe.org/codes-tech-support/codes/code-development-process/building-code-action-committee-bcac/>.

Bibliography: Recommended Fire Protection Practices for Distilled Spirits Beverage Facilities, Third Edition Prepared Under the Auspices of The Distilled Spirits Council of the United States, Inc.

<http://www.discus.org/policy/fireprotection/>

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

This proposal will likely break even on the cost of construction by clarifying what the appropriate Group designation is, elimination of the unnecessary H classifications, and clarifying what protection levels are necessary.

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: This proposal was approved as the exceptions for Group H occupancies are needed and the chapter addressing the specific hazards is necessary. (Vote: 13-1)

Assembly Action:

None

F276-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Linda Purcell, representing architecture PML, Increquests As Submitted.

Commenter's Reason: F276-18

Architectural opinion, related to **use** of facilities and separation of occupancies in facilities that produce distilled spirits above 16% ABV in process and storage, above the 240 gallon limit (sprinkled building).

The intent of the code is to provide a constructed project that provides minimum life safety of users and occupants familiar, and unfamiliar, with the building. *We have no control over the use of the space after the owner takes possession.*

Based on our observed use of distilleries, and H3 rooms, after they are owner occupied, architecture PML, Inc., strongly believes that any measure of life safety that we can provide during design, as required by code, and additional life and operational safety that might be required, or supported by industry best practices, and, as would be dictated by common sense, **should be incorporated into the design, AND SUPPORTED BY THE CODE**

Regarding Occupancy Classification and separation of Occupancies--- If no separation is required between any other Occupancy classification those areas currently required to be H3 Occupancy (for the purposes of *distilled spirits*) there will be significant life safety risks to users, visitors, and even adjacent properties. We strongly recommend that separation between H3 and other occupancies continue to be required, as they are currently required in the code we are most familiar with, the 2015 IBC.

Linda Purcell, AIA

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction considering that other requirements for life safety apply outside of the IBC requirements, this actually may increase the costs to the owners, as the H3 area is specifically defined by FRR (walls) separating occupancy. Without definition of the H3 area, the actual coverage area, and protection from spark, including explosion proof devices, could be much more extensive.

Public Comment 2:

Proponent: Scott Moore, representing Dalkita, Inc. (scott@dalkita.com)requests Disapprove.

Commenter's Reason: The proponents of this measure claim that current code fails to safely regulate distilleries and that the code is unclear. This is a patently false presumption. The current code is clear. The current code does provide for safe regulation of distilleries. However, the subject is complex requiring additional rigor in design and review. This proposal would eliminate the application of H-3 or H-2 occupancy classification to distilleries using and storing Flammable Liquids in excess of the MAQs (Maximum Allowable Quantities). If approved, this proposal will create a clear and present danger to public health, safety, and welfare.

The proponents further state that their intention is to reduce or eliminate unnecessary regulations regarding distilleries. In fact, this proposal will have the opposite affect and increase regulation on not only distilleries but wineries and breweries adding significant construction costs.

It is true that summarizing code requirements for distilleries into a concise package would reduce the efforts needed to design and review such facilities. However, this proposal barely scratches the surface of applicable requirements for safe distilleries found in the current I-codes and NFPA documents they reference. This oversimplification will lead to further misunderstanding of these facilities and guide users of the code toward negligent omission of requirements not addressed in the proposed chapter 40. Safe design of distilleries, particularly micro-distilleries, is a serious matter. They are essentially Flammable Liquids factories in or adjacent to restaurants.

It is true that Ethanol, potable or not, needs to be regulated differently than other non-water miscible Flammable Liquids. This proposal continues the current code approach of discounting graduating flammability properties of varying concentrations of ethanol and water mixtures. A more helpful start to addressing this in the codes would be to identify the fact that 1C water miscible liquid MAQs would more appropriately be higher than 1B liquid MAQs. This proposal ignores the physics of the material being regulated and instead applies regulations in a more arbitrary manner than the current code.

Specific items found in this proposal that present an imminent threat to human life by eliminating regulations currently in place are enumerated below.

IBC 307.1.1(18) (19) would permit unlimited quantities of 1B Flammable Liquid, 95% ethanol with a sea level flash point of 63 degF, in ANY occupancy, including A.

IBC 307.1.1(19) would quadruple the allowable building area for storage of 1C and 1B flammable liquids in barrels (wooden and steel) by shifting the occupancy from H-3 to S-1. Wood soaked in Flammable Liquid a High-hazard commodity. Proper storage of this should be in reduced area compartmentalization as per the current code.

IFC 4001.1.1, 5001.1(10), and 5701.2(10) omit the word wooden in regard to barrels thereby treating, for instance, 55 gallon non-relieving steel barrels the same as wooden barrels. Steel barrels, when exposed to heat, will rupture explosively. Wooden barrels will not.

Specific items found in this proposal that impose additional unnecessary and costly regulation on the beer wine and spirits industry are enumerated below.

IFC 903.2.4.2 and 903.2.9.3 will regulate very small micro-distilleries, with under 120 gallons of spirit, out of business by requiring sprinklers in these facilities where current code does not.

IFC 903.2.9.3 will regulate most wineries out of business by requiring sprinklers for storage of wine where current code does not. Wine, beer, and all other ethanol mixtures under 20% ABV at sea level are non-ignitable per FM Data sheets 729 and 732. Non-ignitable water miscible ethanol mixtures should not be and are not currently regulated as combustible and flammable liquids.

IFC 4003.1 requires drainage and spill control THROUGHOUT the building. Current code only requires these features in parts of the building where Flammable Liquids are actually used and stored and makes exceptions for small quantities.

IFC 4003.2 needlessly requires ethanol vapor monitors for storage of non-ignitable wine. It requires ethanol monitors for storage of spirits in barrels. This is not only unnecessary when proper ventilation calculations are performed but, it also relies on sensors that require proper maintenance and periodic calibration for a critical safety system that could otherwise be provided as fool proof. The other option requires an excessive ventilation rate of 1cfm/sf in barrel storage. Current code requires only 0.06cfm/sf which we have found to be more than adequate to maintain ethanol vapor concentrations at less than 25% of the LFL.

IFC 4003.3.3 requires use of type EX fork trucks even if it has been proven that ventilation will maintain concentrations of Flammable Liquid vapor below 25% of the LFL. Current code acknowledges this and permits type E for trucks where appropriate.

IFC 4004.3 prohibits storage of beer and wine in basements. The current code does not. Beer and wine should be treated entirely different from distilled spirits.

IFC 4005.1 needlessly requires sprinklers for the storage of wine and spirits in bottles. Current code does not.

IMC 502.9.5 exception 2 reverses earlier proposal requirements for ventilation. This is simply confusing.

Below is a partial list of micro-distillery disasters over the past 10 years. Most of these did not meet current code but would be compliant under this new proposal.

Wigle distillery, Pittsburgh - 1 hospitalized

BJ Hookers Distillery, Harris County TX - 1 air lifted to hospital

Island Beach Distillery, Lacey Township, NJ - 1 taken to burn center

Silver Trails Distillery, Marshal County KY - 1 dead, 1 with over a year in recovery

Full Throttle Saloon, Sturgis SD - burned to the ground 2-8-15

Twister Distillery, Moore, OK - 1 hospitalized

Alchemical Solutions, Ashland OR - Neighboring residents experienced smoke related health problems

Tuthilltown Spirits, Gardiner, NY - Destroyed building, no injuries

Current IFC chapters 50 and 57 do not mean that there are no code requirements for barrels as is stated by the proponents of this measure. Rather, per the commentary, wooden barrels are only exempt from the provisions of those two chapters. This means that, under the current code where spirits are stored in wooden barrels, emergency alarms, sprinklers, 25% of the perimeter on an exterior wall, and occupancy separation are required. While 1cfm/sf of ventilation, spill control, secondary containment and explosion control are not.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The proposal will significantly increase the cost to construct distilleries by requiring additional unneeded features. It will particularly damage the wine and beer industries with added construction and operational costs by treating wine and beer, which are not flammable, the same as distilled spirits which is.

Public Comment 3:

Proponent: James Patterson, Denver Fire Department, representing Denver Fire Department requests Disapprove.

Commenter's Reason: The removal of the H classification for volumes exceeding the maximum allowable quantities does not benefit the craft distillers and weakens the code by removing required separations, and standby power requirements for required mechanical ventilation. If a distilling occupancy is not an H occupancy regardless of the alcohol quantities within the occupancy, it can be combined with other occupancies as a non-separated occupancy (such as an assembly banquet hall with a still located in the center as an operational decorative piece) that would allow the public to enter a potentially dangerous situation.

The blanket requirement for fire sprinklers without regard to quantities below the maximum allowable quantities will place an increased burden on the very small/hobby craft distillers. Current requirements allow a distiller to avoid sprinklers by maintaining a maximum allowable quantity below the 120 gallons for a non-sprinklered occupancy and volumes in 1.3 gallon or less containers are not counted in the allowable 120 gallons.

The removal of the requirement for barrels and casks to be "wooden" could create more hazardous storage scenarios such as ethanol in plastic or non-relieving metal barrels.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction.

The proposal's requirement for sprinkler in any distilling occupancy will increase the cost for very small operations.

The proposal's removal of the requirements for an H occupancy would decrease the cost for larger distilling operations.

Public Comment 4:

Proponent: David Tomecek, representing Self (thepyro13@hotmail.com) requests Disapprove.

Commenter's Reason: The proponents of this code change are right to recognize that the application of IBC, IFC and other International Codes to craft-level facilities (i.e., breweries, cideries, wineries, distilleries) can be confusing. However, the approach taken is problematic in that it incorrectly counteracts corrective steps taken in previous editions of the IBC/IFC, confuses the hazards and protections necessary for differing parts of the alcoholic beverage manufacturing industry and appears to misunderstand the issues associated with wooden barrels and casks versus other containers. The proposed change correctly notes that the code-making progress made with respect to alcoholic beverage manufacturing and storage has been somewhat inconsistent. The author would add that the myths and legends of the alcoholic beverage industry, along with misunderstandings of long-standing exceptions within the codes, are not helpful in interpreting and applying requirements. As written, this proposal extends many of those misunderstandings and will codify them in a way that is detrimental to the safety of building occupants, their neighbors and emergency response personnel.

There are two major issues that work against the proposal one involving the split between various portions of the alcoholic beverage industry and the other involving the exceptions often afforded wooden barrels and casks.

The IBC currently includes a threshold value of 16%, which was intentionally inserted to the IBC in the 2003 Edition (at that time it was 12%, revised to 16% in the 2009 Edition). The threshold was ostensibly introduced to address construction of spec warehouses and allow owners, designers and code officials to determine what might be allowed in the two classifications of Group S occupancies. However, that threshold was also introduced into the manufacturing side via incorporation into the Group F occupancies.

Both the 12% and 16% values have support from fire research and appropriately delineate between ethanol-containing liquids that are effectively non-hazardous and those that are, in fact, flammable/combustible liquids. The previous 12% value aligned with beverage manufacturing as it stood at the time carbonated beverages for retail sales tended to have alcohol by volume (ABV) percentages at or below 12% and non-carbonated beverages were typically above that value. Carbonated beverages such as beer, malt liquor, cider, low-alcohol wine, certain post-fermentation carbonated mixtures (e.g., wine coolers, hard lemonades and sodas) and similar liquids fell into the lower category, while non-carbonated liquids fell into the higher category. This natural split in the industry tends to follow the flammability of ethanol solutions. Ethanol solutions tend to become difficult to ignite, even at elevated temperatures, around 11%. The combination of the two elements made the use of 12% a good value.

The increase to 16% appears to have come from consideration of the fermentation process and recognition of the influence on the flammability of ethanol solutions. Beer, cider and low- to mid-strength wine have been found to be difficult to ignite based on a combination of their low ethanol concentration and presence of carbon dioxide in the mixture, effectively making the solution a non-hazard. The carbon dioxide developed during the fermentation process is sufficiently incorporated into the liquid that it carries through that process into short-term storage and final packaging into containers (during which time more CO₂ might be added). Fire testing of finished product, particularly beer, has been performed since the 1950s, and more recent testing of liquids taken at each step of the fermentation process have demonstrated similar results. That is, all have been found to be difficult to ignite such that they act like a non-combustible liquid. The 16% threshold aligns with the point at which most yeasts die off, and therefore adequate carbon dioxide to compensate for increased ethanol vapor production is not created. In effect, this natural boundary value creates a solid delineation point between hazardous and non-hazardous processes, and therefore should not be eliminated or modified. It is recognized that some super-yeasts exist in the beer and wine manufacturing areas, but the makers using these yeasts are relatively limited and can seek relief individually.

Once the fermentation threshold is exceeded or the fermented liquid is modified, such as with distillation, the influence of carbon dioxide falls off quickly and the ethanol solution becomes a flammable/combustible liquid that has no offsetting influence. Therefore, it should be treated as such and have no exception given, particularly an unlimited exception as included in the proposal.

The issue relative to wooden barrels and casks tends to revolve around the myth that wooden barrels are not a hazard. The author of this comment has noted a myriad of opinions that wooden barrels do not burn and/or wooden barrels don't fail when burned. That perspective appears to be emphasized by the IFC Commentary section noted in the proposal (for IFC Section 5702.1). But that assertion is wholly incorrect. The historical evidence from a variety of the respected research agencies is that wooden barrels do, in fact, burn and fail, but do so in a way that does not fit within the generalized approach of catastrophic failure anticipated by NFPA 30, *Flammable and Combustible Liquids Code* and IFC Chapters 50 and 57. The failure methods and resulting hazard from wooden barrels/casks was noted in a series of tests performed by the National Bureau of Fire Underwriters in the late 1940s and subsequently confirmed by tests performed by the National Fire Protection Association, the predecessor of today's FM Global, individual industry leaders (manufacturers or consortiums thereof) and public entities in states with concentrated manufacturing (e.g., Tennessee, Kentucky, Indiana and Iowa). More recently, the failure mechanisms of wooden barrels/casks were reconfirmed in tests performed by FM Global in the mid-2010s. Similar research for fall survivability, impact resistance, manufacturing quality control and other issues confirmed that wooden barrels and casks are a unique hazard that is outside the realm of generalized codes.

It is from this perspective that wooden barrels and casks have been excepted from NFPA 30 and fire codes for decades, and regulation has been deferred to insurance agencies, state regulating organizations and federal rule makers. The unique qualities of wooden barrels/casks are not present in other types, however. Barrels/casks made of metal (mostly steel, generally known as kegs), plastic, clay, concrete and other materials have been found to react to fire more closely to other containers covered by NFPA 30/IFC, and therefore are included in those controls.

Additionally, the introduction of an exception for *any* type of barrel, particularly plastic ones, as included in the proposal sets a dangerous precedence, as well. Many spirits manufacturers that create liqueurs often use plastic barrels as process vessels. High-concentration of ethanol are often shipped in intermediate bulk containers (IBCs) and are often used by spirits manufacturers to augment their own supply or as an input to their particular beverage. Mid-sized plastic containers, such as portable tanks, are used for short-term storage and processing. These makers would naturally ask why they can store spirits in plastic barrels but are regulated in those other containers. The proposed section would actually lend credence to allowing other plastic containers to be unregulated, which is obviously counterintuitive to current practice and known hazards. Other barrel/cask types have similar concerns, but the plastic items are the best example.

Those issues alone suggest that the proposal should be disapproved. However, additional concerns also exist relative to storage of alcoholic beverages as proposed:

- The proposed spill control section (IFC 4003.1) runs counter to language in other sections. In general, the IFC exempts containers less than 55 gallons in groupings of less than an aggregate of 1,000 gallons from spill control and secondary containment (see, for example 2015 IFC, Section 5004.2.1 and 5004.2.2). Since most barrels are less than 55 gallons, this chapter would place a restriction on alcoholic beverage storage not applied to other facilities.
- From a design approach, Section 4003.2, Item 1 is nonsensical. Because the evaporation rate from barrels is environment-dependent, predicting a ventilation cannot be done unless a conservative approach is taken. To comply with Item 1, the facility would need to be built and sampled to achieve compliance which obviously cannot be done without first obtaining a permit and occupancy of the building which cannot be done without providing the ventilation system.
- The specification of a hazardous location industrial truck for storage areas is overly burdensome and is an overstatement of the requirements from NFPA 505. NFPA 505 allows for determination of the type of industrial truck based on the potential operating environment, including consideration of other safety features. If one were to implement the ventilation and detection from Section 4003.2, for example, NFPA 505 would not dictate a classified location industrial truck.
- IFC, Section 4004.3 does not make sense. In effect, the change to Section 307.1.1 of the IBC would eliminate a maximum allowable quantity as being applicable to the storage. That, in turn, means that there is no MAQ to apply within Section 4004.3. But if there is an MAQ applicable in Section 4004.3, it begs the question of how it would otherwise be applicable in other portions of the IBC/IFC.

Aside from the issues related to storage, the proposal makes the leap to eliminate a Group H occupancy for distilleries altogether. This is incongruous with general practice in that the distilling process is, in reality, no different from the production of ethanol for other purposes (e.g., pharmaceuticals, chemical processing, foodstuffs, beauty and health products, etc.). Given the hazards associated with ethanol in general, carving special permissions without controls for this business segment without allowing it for others flies in the face of the general practice of the ICC. Further, that portion of the proposal seems to dismiss the idea of protecting neighboring tenants/owners and the increased risk to emergency responders, given that most craft distilleries are located in leased properties in close proximity to, or directly adjoined to, surrounding tenants or structures. Where insurance requirements and industry practices, as well as some local amendments in place around the country, dictate required physical separation (either with fire rated construction or distance), the IBC would be extremely permissive by comparison.

On the whole, the proposed modifications would unnecessarily increase protection for segments of the industry that need no such protections and would severely compromise the protections that should be afforded for other segments. Therefore, it is highly recommended that this proposal be disapproved and the effort toward consolidating requirements be revisited.

Bibliography: Distilled Spirits Council of the United States (DSCUS) *Recommended Fire Protection Practices for Distilled Spirits Beverage Facilities*

FM Global Loss Prevention Data Sheet (FM LPDS) 8-8, *Distilled Spirits Storage*

FM LPDS 7-74, *Distilleries*

XL Catlin GAPS Guidelines GAP.8.1.0.1, *Barrel Storage of Distilled Spirits*

XL Catlin GAPS Guidelines GAP.17.23.3.2, *Distilleries*

2003 International Building Code and International Fire Code

2009 International Building Code and International Fire Code

2015 International Building Code and International Fire Code

NFPA 30, *Flammable and Combustible Liquids Code*

Fire Hazards and Fire Fighting in Whiskey Warehouses, Kentucky Inspection Bureau, 1957

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The proposed changes will significantly and unnecessarily increase the cost of construction for certain portions of the industry (beer, cider, low- to mid-level wines, etc.). Manufacturing facilities for higher ethanol concentrations may see a limited reduction in construction cost, but the predicted long-term losses within communities due to fire will offset those individual gains via the larger economy.

F277-18

IFC: 202, Chapter 40 (New), Chapter 80

Proposed Change as Submitted

Proponent: Joe Scibetta, representing Self (jscibetta@buildingreports.com)

2018 International Fire Code

Add new definition as follows

ANIMAL HOUSING FACILITY Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production.

Add new text as follows

CHAPTER **40 ANIMAL HOUSING FACILITIES**

4001 GENERAL

4001.1 Scope. Fire protection for animal housing facilities, including agricultural buildings where livestock and poultry are housed, shall comply with the provisions of this chapter.

4002 DEFINITION

4002.1 Definitions. The following term is defined in Chapter 2:
ANIMAL HOUSING FACILITY

4003 PRECAUTIONS

4003.1 Sources of Ignition. Smoking or the use of heating or other devices employing an open flame, or the use of spark-producing equipment is prohibited in all areas of an animal housing facility, including agricultural buildings housing livestock or poultry.

4003.2 Waste Removal and Housekeeping. A procedure to ensure cleanliness and orderliness, including the removal of animal waste, shall be maintained. Permanent storage shall be prohibited in aisles, hallways, or other types of corridors.

4004 FIRE PROTECTION AND LIFE SAFETY

4004.1 Standards. Animal housing facilities shall be in accordance with the applicable provisions of the standards referenced in Table 4004.1. .

Table 4004.1
Fire and Life Safety Standards for Animal Housing

<u>Standard</u>	<u>Subject</u>
<u>NFPA 101</u>	<u>The Life Safety Code</u>
<u>NFPA 150</u>	<u>Standard on Fire and Life Safety in Animal Housing Facilities</u>

Add new standard(s) follows

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

150-16:

Standard on Fire and Life Safety in Animal Housing Facilities

Reason: Currently, the IFC does not recognize this special type of occupancy. While housing for poultry and livestock in agricultural buildings is addressed, non-agricultural facilities where animals are housed and attended to by humans are not addressed. This proposed chapter would address the fire protection and life safety concerns in all types of animal housing, including agricultural buildings that house poultry and livestock. It is important for the IFC to recognize the special operations that take place in these unique facilities, where a secondary population is wholly reliant on a primary population for the necessary, prompt attention required during a fire emergency. This language will allow the IFC to correlate with NFPA 1 and NFPA 101, which both address this special occupancy, and will provide a vital directional path from the IFC to the only standard in our industry that addresses the specific requirements for fire protection and life safety in an animal housing facility, namely NFPA 150. Such correlation and recognition by the IFC would be vital in advancing the work of property protection and life safety in this important sector of our industry.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. These facilities already exist but are simply not yet addressed in the IFC.

F277-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as it would be difficult to enforce as building and fire officials are already overburdened. The standard has provisions that seem difficult to enforce such as facilitating the safe movement of animals out of a building during emergencies and inspecting for animal waste removal. In general the standard is actually more restrictive than certain portions of the building code. The code was written with the primary intention of protecting people. In addition, there was concern that the definition animal housing facility was too broad. (Vote: 14-0)

Assembly Action:

None

F277-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Solomon, National Fire Protection Association, representing National Fire Protection Association requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

ANIMAL HOUSING FACILITY

Area of a building or structure, including interior and adjacent exterior spaces, where animals are fed, rested, worked, exercised, treated, exhibited, or used for production. Such facilities include but are not limited to barns and stables; kennels; animal shelters; animal hospitals and veterinary facilities; zoos; laboratories; agricultural facilities housing animals; and mercantile or business occupancies with animals.

SECTION 319 ANIMAL HOUSING FACILITIES

319.1 General. Animal housing facilities where occupants are expected to delay their emergency egress to care for animals, the means of egress requirements shall comply with the applicable provisions of NFPA 150.

NFPA

National Fire Protection Association
1 Batterymarch Park
Quincy MA 02169-7471

150-16:

Standard on Fire and Life Safety in Animal Housing Facilities

Commenter's Reason: In lieu of stand-alone chapter it is suggested that a section on Animal Housing Facilities would fit better in Chapter 3 of the Code. The revised wording provides additional clarification to the types of facilities which are considered animal housing facilities. The revised wording also provides further clarification that NFPA 150 will be used in addition to the requirements of the IBC and IFC, maintaining the priority of the code on protecting people. The addition of this section is paramount to addressing protecting people in animal housing facilities. The code currently does not adequately address facilities in which people may delay evacuation for the care of animals. The addition of this section will help to protect human life in animal housing facilities by addressing the specific hazard.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The change may increase the cost of construction due to the increased level of life safety for the occupants.

F277-18

F300-18

IFC: 5601.1.3

Proposed Change as Submitted

Proponent: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com)

2018 International Fire Code

Revise as follows

5601.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

1. Storage and handling of fireworks as allowed in Section 5604.
2. Manufacture, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with ~~NFPA 1124~~ Section 5609, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100-185, as applicable for consumer fireworks.

Reason: The current edition of NFPA 1124 does not contain requirements that address the retail sales and storage of consumer fireworks.

This is a companion change to a proposal that expands Section 5609 to address consumer fireworks in a comprehensive manner without a reference to NFPA 1124.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The requirements for Section 5609 are fairly consistent with industry practice and the provisions in previous editions of NFPA 1124.

F300-18

Public Hearing Results

Committee Action:

As Modified

Committee Modification: 5601.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

1. Storage and handling of fireworks as allowed in Section 5604.
2. Manufacture, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with the 2006 edition of NFPA 1124, Section 5609, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100-185, as applicable for consumer fireworks.

Add new standard as follows:

NFPA 1124-06: Code for the Manufacture, Transportation, and Storage of Fireworks and Pyrotechnic Articles

Committee Reason: This proposal was approved with a modification to address the needs of firework sales. Although the current edition of NFPA 1124 does not address such sales jurisdictions need guidance on how to regulate. The committee felt that by referencing the 2006 edition of NFPA 1124 would provide the necessary requirements to regulate the sale of fireworks where such sales are legal. (Vote: 8-5)

Assembly Action:

None

F300-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Robert Solomon, NFPA, representing National Fire Protection Association requests As Modified by This Public Comment.

Modify as follows:

2018 International Fire Code

5601.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

1. Storage and handling of fireworks as allowed in Section 5604.
2. Manufacture, assembly and testing of fireworks as allowed in Section 5605.
3. The use of fireworks for fireworks displays as allowed in Section 5608.
4. ~~The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with the 2006 Edition of NFPA 1124,, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100-185, as applicable for consumer fireworks.~~

5609.1 General. Where the display or temporary storage of fireworks 1.4G (consumer fireworks) is allowed by ~~Section 5601.1.3, Exception 4,~~ such display or storage shall comply with the applicable requirements of NFPA 1124.

Commenter's Reason: Delete sub-item 4 in its entirety. This section is referencing an outdated edition of an NFPA Standard, which negates over ten years of code development by both the NFPA Technical Committee on Pyrotechnics and the NFPA Standards Council. In 2007 the Fire Protection Research Foundation (FPRF) published a hazard assessment research report (see bibliography). As a result of that report, the NFPA Standards Council identified nine safety concerns

that were outlined in their October 2008 decision on this subject. In this decision they identified a process by which a series of approval committees would be tasked with reviewing any related research, reports, findings, or combination thereof, which would substantiate and provide a scientific basis for the nine areas identified; one of which included the submission of sprinkler design criteria for the protection of retail facilities that store and sell consumer fireworks. After nearly ten years and multiple requests without an adequate response, in their 2014 decision, the NFPA Standards Council temporarily withdrew NFPA 1124 and ceased development and removed all language pertaining to storage and retail sale of consumer fireworks. It is the view of the NFPA Standards Council that there should be no standards for the storage and retail sale of consumer fireworks until such time that the remaining research needs have been addressed. If the IFC is to address the retail sale of consumer fireworks, it must do so without referencing a 12 year-old standard which contains requirements that have not been scientifically proven. See bibliography for the 2008 and 2014 Standards Council Decisions.

Bibliography: FPRF Report

<https://www.nfpa.org/-/media/Files/News-and-Research/Resources/Research-Foundation/pyrotechnicsliteraturereview.ashx?la=en>

SC Decision 08-19

<https://www.nfpa.org/-/media/Files/Codes-and-standards/standards-council/fd08738d0819nfpa1124.ashx?la=en&hash=549EAD8F126BE580E2A021F056DFB94097289D0F>

SC Decision 14-1

https://www.nfpa.org/Assets/files/AboutTheCodes/1124/FD14_3_31_D14_1_APA_NFPA1124.pdf

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

There is no cost impact from this change.

Staff Analysis: Public comments to code change proposals F300-18 and F303-18 propose revisions to Section 5601.1.3 and 5609. The actions taken need to address these differences.

F300-18

F303-18

IFC: 5609

Proposed Change as Submitted

Proponent: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com)

2018 International Fire Code

Revise as follows

SECTION 5609 TEMPORARY STORAGE OF CONSUMER RETAIL SALES AND STORAGE OF CONSUMER FIREWORKS

5609.1 General. Where the ~~display or temporary retail sales and associated storage~~ of fireworks 1.4G (consumer fireworks) is allowed by Section 5601.1.3, Exception 4, such display or storage shall comply with the applicable requirements of ~~NFPA 1124~~ this section.

Add new text as follows

5609.2 Retail sales of consumer fireworks. Retail sales of consumer fireworks in both new and existing buildings, structures, and facilities shall comply with the requirements of this section unless otherwise indicated.

5609.2.1 Special Requirements for Retail Sales of Consumer Fireworks. Retail sales of consumer fireworks, including their related storage and display for sale of such fireworks, shall be in accordance with this section.

5609.2.1.1 Occupancy classification. Retail sales of consumer fireworks in buildings complying with this Section shall be classified as Use Group M.

5609.2.1.2 Prohibition. The retail sales of fireworks and novelties that do not comply with the regulations of the U.S. Consumer Product Safety Commission as set forth in 16 CFR 1500 and 1507 and the regulations of the U.S. Department of Transportation as set forth in 49 CFR 100 to 178, including their related storage and display for sale, shall be prohibited.

5609.2.2 Third party testing. Consumer fireworks shall be tested and certified by an approved, independent third party testing agency for compliance with the regulations of the Consumer Product Safety Commission (CPSC) as set forth in 16 CFR 1500 and 1507, using a test sampling plan that meets CPSC requirements.

5609.2.3 Permits. Where required by state or local laws, ordinances, or regulations, a permit for the following shall be obtained for the storage of consumer fireworks in connection with the retail display or sale of consumer fireworks to the public.

5609.2.4 Fire department access. Any portion of an exterior wall shall be accessible within 150 ft. (45.7 m) of a public way or an approved fire department access road.

5609.2.5 Smoking. Smoking shall be regulated in accordance with Sections 5609.2.5.1 and 5609.2.5.2

5609.2.5.1 Location. Smoking shall not be permitted inside or within 50 ft. (15.5 m) of sales facility

5609.2.5.2 Signage. At least one sign that reads as follows, in letters at least 2 in. (51 mm) high on a contrasting background, shall be conspicuously posted at each entrance or within 10 ft. (3.05 m) of every aisle directly serving the fireworks sales area:

FIREWORKS

NO SMOKING

5609.2.6 Retail sales displays. Retail displays of fireworks shall be in accordance with Sections 5609.2.6.1 through 5609.6.3.3.

5609.6.1 Height of sales display. Partitions, counters, shelving, cases and similar space dividers shall not exceed 6 ft. (1.8 m) in height above the floor surface inside the perimeter of the retail sales area. Where located along the perimeter

of the consumer fireworks retail sales area, the maximum height of sales display shall be limited to 12 ft. (3.6 m).

5609.2.6.2 Flame breaks. Where continuous displays of consumer fireworks are located on shelving, cases, counters, and similar display fixtures, a flame break shall be provided so that the maximum distance between flame breaks does not exceed 16 ft (4.9 m) where measured along the length of the display.

5609.2.6.2.1 Extension of Flame break. The flame break shall extend be in accordance with the following:

1. From the display surface to not less than 6 in. (150 mm) above the full height of the displayed merchandise or to the underside of the display surface directly above.

2. For the full depth of the displayed merchandise.

5609.2.6.2.2 Mixed packaging. Where packaged fireworks merchandise is displayed on the same level as individual unpackaged fireworks devices, the flame break required in 5609.2.7.2.1 shall not be required where in accordance with both of the following:

1. The length of the display level containing individual unpackaged fireworks devices is interrupted by packaged fireworks merchandise, or open space, or any combination thereof, having a continuous length of not less than 8 ft. (2.4 m).
2. The distance between flame breaks does not exceed 32 ft. (9.8 m).

5609.2.6.2.3 Continous storage. Where a merchandise display level contains packaged fireworks merchandise, such merchandise shall be permitted to be displayed in a continuous length on the same level, where the display does not exceed 32 ft. (9.8 m) without the flame break required in 5609.2.6.2.1.

5609.6.2.4 Aisle. An aisle having a minimum width of 48 in. (1.2 m) shall be permitted to substitute for the flame break.

5609.2.6.2.5 Displays facing aisles. Where displays of merchandise face aisles that run along both long sides of the display fixtures or display surface, a flame break shall be installed lengthwise between the abutting display fixtures or along the approximate longitudinal centerline of the display surface so as to separate the merchandise facing one of the aisles from the merchandise that abuts it facing the other aisle.

5609.2.6.2.6 Freestanding displays. Freestanding display racks, pallets, tables, or bins containing packaged fireworks merchandise shall be permitted without flame breaks, provided the dimensions of the area occupied by the fireworks merchandise do not exceed 4 ft. (1.2 m) in width, 8 ft. (2.4 m) in length, and 6 ft. (1.8 m) in height, and the displayed fireworks merchandise is separated from other displays of merchandise by aisles having a minimum clear width of 4 ft. (1.2 m).

5609.2.6.2.7 Displays of hardboard panels. Where both of the facing vertical surfaces of the abutting display fixtures are constructed of perforated hardboard panels not less than ¼ in. (6 mm) thick that are separated from each other by an open space not less than 1 ½ in. (38 mm) wide, a flame break shall not be required.

5609.2.6.2.8 Permanent sales facilities. In Permanent Sales Facilities the longitudinal flame break shall not be required where the display fixture or surface is adjacent to an aisle that is not used for public egress.

5609.2.6.3 Shelving. Shelving shall be in accordance with 5609.2.6.3.1 through 5609.2.6.3.3

5609.2.6.3.1 General. Shelving or other surfaces used to support fireworks display merchandise shall be permitted to have not more than 10 percent of the area of the shelf contain holes or other openings.

5609.2.6.3.2 Openings. The 10 percent limitation on the area of holes or other openings in the shelf used to support fireworks display merchandise shall not be applicable under the following conditions:

1. Where both of the facing vertical surfaces of the abutting display fixtures are constructed of perforated hardboard panels not less than ¼ in. (6 mm) thick and separated from each other by an open space not less than 1 ½ in. (38 mm) wide.
2. Where such merchandise is suspended from or fastened to the shelf or surface or is displayed as packaged merchandise on the surface or in bins.

5609.2.6.3.3 Flame breaks and solid display. Flame breaks and solid display surfaces shall not be required for

packaged fireworks merchandise displayed in bins or display racks or on pallets or tables located at the end of a row of display fixtures where the following conditions are met:

1. Such end displays are separated from the ends of the display fixtures by an open space not less than 3 in. (76 mm) wide.
2. The fireworks merchandise occupies an area having dimensions not greater than the width of the end of the row of display fixtures and a depth not greater than 30 in. (910 mm).
3. The minimum required widths of the adjacent aisles are maintained, but in no case is the aisle width less than 48 in. (1.2m).

5609.2.7 Covered fuses. Only consumer fireworks meeting the criteria for covered fuses shall be permitted.

5609.2.7.1 Packaged fireworks. A consumer fireworks device shall be considered as having a covered fuse if the fireworks device is contained within a packaged arrangement, container, or wrapper that is configured such that the fuse of the fireworks device cannot be touched directly by a person handling the fireworks without the person having to puncture or tear the packaging or wrapper, unseal or break open a package or container, or otherwise damage or destroy the packaging material, wrapping, or container within which the fireworks are contained.

5609.2.8 Aerial Devices. Aerial devices shall be packaged and displayed for sale in a manner that will limit travel distance of ejected pyrotechnic components if ignition of the fireworks occurs.

5609.2.9 Other Materials. Combustible materials and merchandise shall not be stored directly above the consumer fireworks in retail sales.

5609.2.10 Training. All personnel handling consumer fireworks shall receive safety training related to the performance of their duties.

5609.3 Retail Sales of Consumer Fireworks in Permanent Sales Facilities. Permanent sales facilities for retail sale of consumer fire works shall comply with Sections 5609.3.1 through 5609.3.7.3.

5609.3.1 Quantity Limitations. The floor area occupied by the retail displays of consumer fireworks in Permanent Sales Facilities shall not exceed 40 percent of the available floor area within the retail sales area.

5609.3.2 Construction of Permanent Sales Facilities. New permanent sales facilities shall not exceed one story in height.

5609.3.3 Multiple-Tenant buildings

. Multiple-tenant buildings shall comply with Sections 5609.3.3.1 and 5609.3.3.2.

5609.3.3.1 Buildings with other tenants. Where new permanent sales facilities are located in a building containing other tenants, the permanent sales facility shall be separated from the other tenants by fire barriers with a minimum fire resistance rating of two hours and having no openings.

5609.3.3.2 Sprinkler protection. Where the new permanent sales facilities are protected with an automatic sprinkler system complying with 903.3.1.1, the fire resistance rating of the fire barrier required by 5609.3.3.1 shall be permitted to be not less than 1 hour.

5609.3.4 Fire protection. An automatic sprinkler system complying with 903.3.1.1 shall be provided throughout permanent sales facilities in which fireworks sales are conducted as follows:

1. In new permanent sales facilities greater than 3000 ft² (276 m²) in area
2. In existing permanent sales facilities greater than 7500 ft² (694 m²) in area

5609.3.5 Storage rooms. Storage rooms, containing consumer fireworks in a new Permanent Sales Facilities shall be protected with an automatic sprinkler system complying with 903.3.1.1 or separated from the retail sales area by a fire barrier having a fire resistance rating of not less than 1 hour.

5609.3.6 Fire alarms. A fire alarm system shall be provided in accordance with Section 907.

5609.3.7 Separation distances. Separation distances shall be provided in accordance with Section 5609.3.7.1 through 5609.3.7.3 as applicable.

5609.3.7.1 New facilities

New Permanent Sales Facilities shall be separated from adjacent permanent buildings and structures in accordance with Table 5609.3.7.1.

5609.3.7.2 Existing facilities. Existing Permanent Sales Facilities shall be separated from adjacent permanent buildings and structures by not less than 10 ft (3.05m) or shall be separated by a wall with a 1-hour fire resistance rating.

**Table 5609.3.7.1
SEPARATION DISTANCE BETWEEN NEW PERMANENT BUILDINGS AND STRUCTURES**

Separation distance		Exterior Wall Fireresistance Rating (hr)	Exterior Wall Opening Protection Rating (hr)
<u>Ft</u>	<u>M</u>		
<u>< 10</u>	<u><3.05</u>	<u>2</u>	<u>1-1/2</u>
<u>>10 - <60</u>	<u>>3.05- <18.3</u>	<u>1</u>	<u>3/4</u>
<u>> 60</u>	<u>>18.3</u>	<u>0</u>	<u>0</u>

5609.3.7.3 Parking. No motor vehicle or trailer used for the storage of consumer fireworks shall be parked with 10 ft. (3 m) of a permanent sales facility, except when the vehicle or trailer is delivering, loading, or unloading fireworks or other merchandise and materials used, stored, or displayed for sale in the facility.

5609.3.8 Means of Egress. Means of egress in permanent retail sales facilities shall be in accordance with Sections 5609.3.8.1 through 5609.3.8.3.

5609.3.8.1 Number of exits. The minimum number of exits provided from the retail sales area shall be not less than three.

5609.3.8.2 Exit access travel distance. Exits provided for permanent sales facilities shall be located so that the exit access travel distance does not exceed 75 ft. (22.9 m).

5609.3.8.3 Emergency lighting. Emergency lighting shall be provided for permanent sales facilities.

5609.3.9 Operations. Operations of retail sales of consumer fireworks in permanent facilities shall be in accordance with Sections 3609.3.9.1 through 5609.3.9.3.

5609.3.9.1 Distances from Entrances and Exits. Distance to entrances and exits shall comply with Sections 5609.3.9.1.1 and 5609.3.9.1.2.

5609.3.9.1.1 Public entrances. No consumer fireworks shall be displayed for sale or stored within 5 ft (1.5 m) of any public entrance in an enclosed building or structure.

5609.3.9.1.2 Private entrances. No consumer fireworks shall be displayed for sale or stored within 2 ft (0.6 m) of any exit or private entrance in an enclosed building or structure.

5609.3.9.2 Security. Fire works shall be kept Secure in permanent sales facilities in accordance with Sections 5609.3.9.2.1 through 5609.3.9.2.3.

5609.3.9.2.1 Non business hours. Permanent sales facilities shall be secured when unoccupied and not open for business, unless fireworks are not kept in the facility during such times.

5609.3.9.2.2 Removal and transferring. The fireworks displayed or stored in a permanent sales facilities shall be allowed to be removed and transferred to a temporary storage structure or location.

5609.3.9.2.3 Ignition sources. Fireworks shall not be ignited, discharged, or otherwise used within 300 ft. (91.5 m) of a permanent sales facilities.

5609.3.9.3 Display and Handling. Not less than 50 percent of the available floor area within the retail sales area shall be open space that is unoccupied by retail displays and used only for aisles and cross-aisles.

5609.4 Requirements for Retail Sales of Consumer Fireworks in Temporary Sales Facilities. The retail sales of consumer fire works in temporary sales facilities shall be in accordance with Sections 5609.4.1 through 5609.4.6.4.

5609.4.1 Construction of Temporary Sales Facilities. New Temporary Sales Facilities shall not exceed one story in height.

Exception: Temporary Sales Facility stands greater than 1600 ft2 (148 m2) in area that also meet the construction requirements for a permanent structure.

5609.4.2 Sale from vehicles. The sale of consumer fireworks from vehicles including automobiles, trucks, motor homes and travel trailers is not permitted except when the vehicle meets the requirements for a Temporary Sales Facility stand.

5609.4.3 Signage. In addition to the signage required in 5609.2.6 at least one sign that reads as follows, in letters at least 4 in. (102 mm) high on a contrasting background, shall be conspicuously posted on the exterior the temporary sales facility:

NO FIREWORKS DISCHARGE

WITHIN 100 FEET

5609.4.4 Separation Distances. Temporary sales facilities shall be located as specified in Table 5609.4.4 and in accordance with Sections 5609.4.4.1 and 5609.4.4.2.

5609.4.4.1 Clearance to Combustibles. The area located within 10 ft. (9 m) of a temporary sales facilities shall be kept free of accumulated dry grass, dry brush, and combustible debris.

5609.4.4.2 Parking. No motor vehicle or trailer used for the storage of consumer fireworks shall be parked within 10 ft. (3 m) of a Temporary Sales Facilities, except when the vehicle or trailer is delivering, loading, or unloading fireworks or other merchandise and materials used, stored, or displayed for sale in the facility.

**Table 5609.4.4
MINIMUM SEPARATION DISTANCES FOR TEMPORARY SALES FACILITIES**

Type	Separation Distance											
	Buildings		Combustibles		Tents		Vehicle Parking		Stands		Storage of Fireworks	
	Ft	M	Ft	M	Ft	M	Ft	M	Ft	M	Ft	M
Tents	20	6.1	20	6.1	20	6.1	10	3.05	20	6.1	20	6.1
Stands	20	6.1	10	3.05	20	6.1	10	3.05	20	6.1	20	6.1

5609.4.5 Means of Egress. Means of egress and temporary retail sales of consumer fire works shall be in compliance with Sections 5609.4.5.1 through 5609.4.5.6.

5609.4.5.1 Number of Exits. The minimum number of exits provided from the retail sales area shall be not less than three for Temporary Sales Facilities that are larger than 1,200 ft2. All other Temporary Sales Facilities shall have a minimum of two exits, regardless of area.

5609.4.5.2 Egress through storage rooms. Required means of egress from the retail sales area shall not be allowed to pass through storage rooms or areas.

5609.4.5.3 Egress Travel Distance. Egress travel distance shall be in accordance with Sections 5609.4.5.3.1 and 5609.4.5.3.2.

5609.4.5.3.1 Exits provided for Temporary Sales. Facilities tents shall be located so that the exit access travel distance does not exceed 75 ft. (22.9 m).

5609.4.5.3.2 Exits provided for Temporary Sales. Facilities stands shall be located so that the exit access travel distance does not exceed 35 ft. (10.6 m).

5609.4.5.4 Aisles. Aisles shall have a minimum clear width of 48 in. (1.2 m) except in temporary sales facilities stands where the interior is not accessible to the public, the minimum clear width of aisles shall be 28 in. (710 mm).

5609.4.5.5 Dead-end aisles. Dead-end aisles shall be prohibited.

5609.4.5.6 Emergency Lighting. Emergency lighting shall be provided for temporary sales facilities. Emergency lighting shall not be required in Temporary Sales Facilities that are not open for business after dusk or for Temporary Sales Facilities stands where the interior is not accessible to the public.

5609.4.6 Sales Display. Consumer fireworks shall be displayed in a manner that prevents the fireworks from being handled by persons other than those operating, supervising, or working in the Temporary Sales Facilities stand where the stand does not allow access to the interior by the public.

5609.4.7 Portable Generators. Portable generators shall be in accordance with Sections 5609.4.7.1 through 5609.4.7.4.

5609.4.7.1 Fuel. Fuel for generators shall be permitted to be Class I, Class II, or Class III liquids and shall be limited to not more than 5 gallons (18.9 L) unless the generator fuel storage is located at least 50 ft. (15.2 m) from the temporary sales facility.

5609.4.7.2 Limitations. Portable generators supplying power to Temporary Sales Facilities shall use only Class I or Class III combustible liquid fuels.

5609.4.7.3 Separation of generators. Portable generators shall be located not less than 20 ft. (6.1 m) from the Temporary Sales Facilities.

5609.4.7.4 Separation of fuels. Generator fuels shall be stored not less than 20 ft. (6.1 m) from the Temporary Sales Facilities.

5609.5 Requirements for Retail Sales of Consumer Fireworks in Stores. Retail sale of consumer fireworks shall comply with Section 5609.5.1 through 5609.5.6

5609.5.1 Applicability. The requirements of Section 5609.4 do not apply where both of the following conditions exist:

1. The area of the retail sales floor occupied by the retail displays of consumer fireworks does not exceed 25 percent of the area of the retail sales floor in the building or 600 ft² (55.5m²), whichever is less.
2. The consumer fireworks are displayed and sold in a manner approved by the fire code official and comply with the applicable provisions of this code, federal and state law, and local ordinances.

5609.5.2 Requirements. Consumer fireworks displayed for sale in stores shall comply with all of the following:

1. Such fireworks shall be under the visual supervision of a store employee or other responsible party while the store is open to the public.
2. Such fireworks shall be packaged fireworks merchandise.
3. Such fireworks shall be packaged and displayed for sale in a manner that will limit travel distance of ejected pyro-technical components if ignition of the fireworks occurs.
4. Where consumer fireworks meeting the description of aerial devices and audible ground devices are sold, such devices shall be displayed for sale in an area of the store that is physically separated from the rest of the store in a manner that restricts entry by the public, and the area of the store shall be provided with not less than two means of egress, so located that there is no common path of travel and the distance to reach an egress point from the area does not exceed 35 ft (10.7m).

5609.5.3 Automatic Sprinkler System. The store shall be protected with an automatic sprinkler system in accordance

with 903.3.1.1 in accordance with the following:

1. New stores greater than 3000 ft² (552.2 m²) in area
2. Existing stores greater than 7500 ft² (694 m²) in area

5609.5.4 Fire Alarm System. A fire alarm system shall be provided as required by Section 907. In addition, in stores greater than 3000 ft² (280 m²), a public address system or a means for manually activating audible and visible alarm indicating devices located throughout the facility shall be provided at a constantly attended location when the store is occupied.

5609.5.5 Storage Rooms. Storage rooms containing consumer fireworks in a store shall be protected with an automatic sprinkler system complying with 903.3.1.1 or shall be separated from the retail sales area by a fire barrier having a fire resistance rating of not less than 1 hour.

5609.5.6 Means of Egress. Exits provided for stores shall be located so that the exit access travel distance from the area where consumer fireworks are displayed does not exceed 75 ft. (22.9 m).

5609.6 Storage of Consumer Fireworks. The storage of consumer fireworks shall comply with Sections 5609.6.1 through 5609.6.9.3

5609.6.1 Non applicability. This section shall not apply to buildings or facilities where the net weight of the pyrotechnic content of consumer fireworks stored does not exceed 125 lb., or 250 lb. where the building is protected throughout with an automatic sprinkler system complying with 903.3.1.1

5609.6.2 Storage locations. Consumer fireworks storage buildings shall not also be used as a magazine for the storage of other explosive materials. Consumer fireworks shall be permitted to be stored in a magazine.

5609.6.3 Reworking and processing. Any reworking or processing of consumer fireworks shall only be permitted to be performed in a building meeting the requirements of NFPA 1124 for Process Buildings.

5609.6.4 Occupancy restrictions. Consumer fireworks storage buildings shall not be used for residential occupancies and shall not be located in residential areas.

5609.6.5 Finished products. Finished consumer fireworks at a manufacturing or distribution facility shall be stored in consumer fireworks storage buildings, trailers, semitrailers, metal shipping containers, or magazines.

5609.6.6 Receiving and packaging. Receiving, picking, packing, packaging, and shipping shall be permitted in consumer fireworks storage buildings or areas.

5609.6.7 Separation Distances. Consumer fireworks storage or work buildings at distribution facilities shall be separated from adjacent permanent buildings and structures in accordance with Table 5609.6.7

**Table 5609.6.7
SEPARATION DISTANCE FOR CONSUMER FIREWORKS STORAGE OR WORK BUILDINGS**

Separation distances		Exterior Wall Fireresistance Rating (hr)	Exterior Wall Opening Protection Rating (hr)
Ft	M		
<u>< 10</u>	<u>< 3.05</u>	<u>2</u>	<u>1-1/2</u>
<u>>10 - <60</u>	<u>>3.05- <18,3</u>	<u>1</u>	<u>3/4</u>
<u>> 60</u>	<u>>18.3</u>	<u>0</u>	<u>0</u>

5609.6.8 Operations. Operations shall be in accordance with Sections 5609.8.1 through 5609.6.8.

5609.6.8.1 Receiving and storing. Receiving, storing, picking from cartons, packing into cartons, packaging into retail packages including assortments, shipping, and other similar operations involving finished consumer fireworks shall be permitted in consumer fireworks storage or work buildings, rooms, or areas that meet the requirements of this chapter.

5609.6.8.2 Picking, sorting and packaging. Picking, sorting, packaging, packing, and other similar operations involving

finished consumer fireworks shall be conducted in consumer fireworks work buildings or consumer fireworks work rooms or areas in consumer fireworks storage buildings that meet the requirements of this chapter.

5609.6.8.3 Locking doors and windows. Exterior doors and windows shall be kept locked when the building is not occupied or otherwise attended.

5609.6.8.4 Consumer fireworks. 5609.6.8.4 Consumer fireworks shall be in accordance with the following:

1. Consumer fireworks shall be stored in DOT-approved packaging.
2. Cartons shall be stacked neatly and in a stable manner.
3. Consumer fireworks returned to these buildings shall be permitted to be stored temporarily in cartons until repackaging or repacking can be performed.
4. Firearms, unless carried by authorized personnel or law enforcement personnel, shall not be permitted inside a consumer fireworks storage or work building, room, or area or within 50 ft. (15.2 m) of stored consumer fireworks.

5609.6.9 Housekeeping. Housekeeping shall comply with Section 5609.6.9.1 through 5609.6.9.3.

5609.6.9.1 Loose black powder. Loose black powder or other exposed pyrotechnic composition shall be prohibited. If loose composition is discovered, it shall be removed immediately and disposed of in an approved manner.

5609.6.9.2 Fireworks storage or work areas. Consumer fireworks storage or work buildings, rooms, or areas shall comply with all of the following:

1. Interiors shall be kept clean, dry and free of grit and rubbish.
2. Tools used for cleaning up loose pyrotechnic composition shall not have spark-producing metal parts.
3. Sweepings shall be disposed of in an approved manner.

5609.6.9.3 Clearance. The area around consumer fireworks storage or work buildings shall be kept clear of brush, dried vegetation, rubbish, and similar combustibles for a distance of at least 25 ft. (7.6 m).

Reason: The current edition of NFPA 1124 no longer contains requirements addressing the retail sales and storage of consumer fireworks. Whereas almost every state allows the sale of some consumer fireworks, the fire official has no requirements to enforce that specifically address such facilities. The proposal is not about whether the sale of consumer fireworks should be permitted; but rather, where they are permitted the proposal provides a minimum set of requirements that a fire official can apply to provide an acceptable level of safety.

The requirements contained in this proposal are not as comprehensive as the standalone requirements contained in previous editions of NFPA 1124. Instead, the approach taken was to rely on other sections of the IFC to address provisions such as illumination of the means of egress, portable fire extinguishers, electrical equipment, etc. Instead, the proposed revisions focus on requirements that are mostly unique to consumer fireworks facilities such as flame breaks and covered fuses.

The proposal contains a set of general requirements that apply to all facilities in which consumer fireworks are sold (5609.2). The general provisions are then followed by requirements unique to three separate types of facilities: permanent sales facilities (5609.3); temporary sales facilities (5609.4); and retail stores in which consumer fireworks are displayed and sold along with other goods and merchandise (5609.5). The storage related to the sale of consumer fireworks is covered in Section 5609.6.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. The transition from the requirements of NFPA 1124 to the proposed requirements for Section 5609 should not impact the cost of construction.

F303-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon the action taken on code change proposal F300-18. There was some discussion regarding the verbiage in this proposal that it needs to better clarify how to deal with new and existing buildings. In addition, there was concern with the application of the provisions for temporary sales. Finally, Section 5609.4.5 of the proposal does not reference Chapter 10 of the coded for means of egress. (Vote: 14-0)

Assembly Action:

None

F303-18

Individual Consideration Agenda

Public Comment 1:

Proponent: William Koffel, representing American Pyrotechnics Association (wkoffel@koffel.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

FLAME BREAK

A solid material, without holes, utilized to retard the spread of flame.

5601.1.3 Fireworks. The possession, manufacture, storage, sale, handling and use of fireworks are prohibited.

Exceptions:

- 1.Storage and handling of fireworks as allowed in Section 5604.
- 2.Manufacture, assembly and testing of fireworks as allowed in Section 5605.
- 3.The use of fireworks for fireworks displays as allowed in Section 5608.
- 4.The possession, storage, sale, handling and use of specific types of Division 1.4G fireworks where allowed by applicable laws, ordinances and regulations, provided that such fireworks and facilities comply with ~~NFPA 1124~~Section 5609, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100-185, as applicable for consumer fireworks.

SECTION 5609 TEMPORARY RETAIL SALES AND ASSOCIATED STORAGE OF

CONSUMER FIREWORKS

5609.1 General. Where the display or ~~temporary~~ storage of fireworks 1.4G (consumer fireworks) is allowed by Section 5601.1.3, Exception 4, such display ~~or~~ and storage shall comply with the applicable requirements of the 2006 edition of NFPA 1124, and this section.

5609.2 Retail sales of consumer fireworks. Retail sales of consumer fireworks in both new and existing facilities shall comply with this Sections 5609.2.1 through 5609.2.5

5609.2.1 Occupancy Classification. Retail sales of consumer fireworks shall be limited to buildings of Use Group M.

5609.2.2 Permits. Where required by state or local laws, ordinances, or regulations, a permit shall be obtained for the storage of consumer fireworks in connection with the retail display or sale of consumer fireworks to the public.

5609.2.3 Flame Breaks. Where continuous displays of consumer fireworks are located on shelving, cases, counters, and similar display fixtures, a flame break shall be provided such that the maximum distance between flame breaks does not exceed 16 ft. (4.9 m.) where measured along the length of the display.

5609.2.3.1 Minimum dimensions. The flame break shall extend as follows:

1. The display surface to not less than 6 in. (150 mm) above the full height of the displayed merchandise or to the underside of the display surface directly above.
2. For the full depth of the displayed merchandise.

5609.2.3.2 Mixed packaging types. Where packaged fireworks merchandise is displayed on the same level as individual unpackaged fireworks devices, the flame break required in 5609.2.3 shall not be required where both of the following criteria are met:

1. The length of the display level containing individual unpackaged fireworks devices is interrupted by packaged fireworks merchandise, or open space, or any combination thereof, having a continuous length of not less than 8 ft. (2.4 m).
2. The distance between flame breaks does not exceed 32 ft. (9.8 m).

5609.2.3.3 Display of packaged fireworks. Where a merchandise display level contains packaged fireworks merchandise, such merchandise shall be permitted to be displayed in a continuous length on the same level, where the display does not exceed 32 ft. (9.8 m) without the flame break required in 5609.2.3.

5609.2.3.4 Aisle alternative. An aisle having a minimum width of 48 in. (1.2 m) shall be permitted to substitute for the flame break.

5609.2.3.5 Abutting displays. Where displays of merchandise face aisles that run along both long sides of the display fixtures or display surface, a flame break shall be installed lengthwise between the abutting display fixtures or along the approximate longitudinal centerline of the display surface so as to separate the merchandise facing one of the aisles from the merchandise that abuts it facing the other aisle.

5609.2.3.6 Freestanding displays. Freestanding display racks, pallets, tables, or bins containing packaged fireworks merchandise shall be permitted without flame breaks, provided the dimensions of the area occupied by the fireworks merchandise do not exceed 4 ft. (1.2 m) in width, 8 ft. (2.4 m) in length, and 6 ft. (1.8 m) in height, and the displayed fireworks merchandise is separated from other displays of merchandise by aisles having a minimum clear width of 4 ft. (1.2 m).

5609.2.3.7 Hardboard panel separation. Where both of the facing vertical surfaces of the abutting display fixtures are constructed of perforated hardboard panels not less than ¼ in. (6 mm) thick that are separated from each other by an open space not less than 1 ½ in. (38 mm) wide, a flame break shall not be required.

5609.2.3.8 Non-public aisle. The longitudinal flame break shall not be required where the display fixture or surface is adjacent to an aisle that is not used for public egress.

5609.2.4 Covered Fuses. Only consumer fireworks meeting the criteria for covered fuses shall be permitted. A consumer fireworks device shall be considered as having a covered fuse if the fireworks device is contained within a packaged arrangement, container, or wrapper that is configured such that the fuse of the fireworks device cannot be touched directly by a person handling the fireworks without the person having to puncture or tear the packaging or wrapper, unseal or break open a package or container, or otherwise damage or destroy the packaging material, wrapping, or container within which the fireworks are contained.

5609.2.5 Automatic Sprinkler System. An automatic sprinkler system complying with 903.1.1 shall be provided throughout facilities in which fireworks sales are conducted in the following buildings:

1. New facilities greater than 3000 ft² (276 m²) in area
2. Existing facilities greater than 7500 ft² (694 m²) in area

5609.3 Storage of Consumer Fireworks Storage of consumer fireworks in both new and existing buildings, structures, and facilities shall comply with the requirements of Sections 5609.3.1 and 5609.3.2.

5609.3.1 Automatic Sprinkler System. An automatic sprinkler system complying with 903.1.1 shall be provided in consumer fireworks storage buildings greater than 12,000 ft². (1115 m²).

5609.3.2 Design Criteria The automatic sprinkler system shall be designed using the following criteria for the areas in which the consumer fireworks are stored in DOT-approved packaging:

1. Consumer fireworks stored in DOT-approved packaging shall be considered as a Class IV commodity.
2. Consumer fireworks stored to a height not greater than 10 ft. (3 m) in racks, or 12 ft. (3.7 m) otherwise, shall be classified as an Ordinary Hazard (Group 2) occupancy.
3. Consumer fireworks stored to a height not greater than 12 ft. (3.7 m) in racks, but greater than 10 ft. (3 m), shall be classified as an Extra Hazard (Group 1) occupancy.
4. Consumer fireworks stored to a height greater than 12 ft. (3.7 m) shall be protected by an automatic sprinkler system, acceptable to the fire code official, that is designed using a fire control approach or a special design approach.

Commenter's Reason: Instead of providing the detailed requirements contained in the Public Proposal, the Code Development Committee chose to reference the 2006 Edition of NFPA 1124. However, the 2006 Edition of NFPA 1124 does not contain requirements for flame breaks and covered fuses. In the 2006 Edition of NFPA 1124, the threshold for when automatic sprinkler protection is required uses a higher area than what is contained in the original printing of the 2013 Edition of NFPA 1124. The Public Comment (and original Public Proposal) used the smaller area threshold consistent with the 2013 Edition of NFPA 1124.

In taking the action that was taken, the Code Development Committee requested that the FCAC review the action taken and suggest additional changes. In meeting with the FCAC, it was recommended the the requirements for flame breaks, covered fuses, and the sprinkler threshold requirements be added to Section 5609.

It should also be noted that based upon the action taken by the Code Development Committee it was impossible to revise F303 during the Code Development Hearings. As such, the clean-up necessary for Section 5609 had to be accomplished by a Public Comment. If the Public Comment is not accepted, Section 5609 will simply reference NFPA 1124, without specifying the edition, and it will not contain the additional protection provided by flame breaks, covered fuses, and more restrictive sprinkler system thresholds.

The Public Comment addresses the need to revise Section 5609 based upon the Committee Recommendation for Approval as Modified of F300-18. A correlative edit has been made to Exception 4 to Section 5601.1.3 to re-insert Section 5609 as originally proposed.

Cost Impact: The net effect of the public comment and code change proposal will increase the cost of construction. The additional cost will be that associated with flame breaks and the more restrictive sprinkler system thresholds. Most, if not all, consumer fireworks sold in the USA should not be protected with covered fuses which is not a construction cost.

Staff Analysis: Public comments to code change proposals F300-18 and F303-18 propose revisions to Section 5601.1.3 and 5609. The actions taken need to address these differences.

F303-18

F304-18

IFC: TABLE 5703.6.2, Chapter 80

Proposed Change as Submitted

Proponent: Bob Torbin, OmegaFlex, representing OmegaFlex (bob.torbin@omegaflex.net)

2018 International Fire Code

Revise as follows

**TABLE 5703.6.2
PIPING STANDARDS**

PIPING USE	STANDARD
Power Piping	ASME B31.1
Process Piping	ASME B31.3
Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids	ASME B31.4
Building Services Piping	ASME B31.9
Double Containment Piping	UL971A: UL1369

Add new standard(s) follows

UL

Underwriters Laboratories LLC
333 Pfingsten Road
Northbrook IL 60062

971A -2006:

**Outline of Investigation for Metallic Underground Fuel Pipe
1369-18:**

Aboveground Piping Requirements

Reason: This proposal covers metallic and composite primary carrier, secondary containment, and integral primary/secondary piping systems (piping and fittings) intended for above and below ground use in applications for the distribution of petroleum-based flammable and combustible liquids. The intent and design of double containment systems are focused on preventing fuel/liquid leaks that could result in severe fire hazards.

The primary metallic (316 stainless steel) tubing is a zero-permeation pipe which is highly resistant to corrosion with exceptional crush resistance. The UV stabilized Nylon 12 protective containment layer offers exceptional resistance to hydrocarbons, chemical and water exposure, and carries a 50 psig rating. An EFEP secondary barrier jacket layer is bonded to the Nylon 12 protective layer to offer secondary containment with exceptional permeation resistance for product compatibility. The interstitial space between the tubing and jacket allows continuous monitoring for leak detection, with a 50 psig rating for pressurized systems. The self-flaring fitting provides a metal to metal sealing surface with excellent reliability and is field-attachable using standard hand tools. This class of piping product has been used (above and below grade) for a variety of fuels for several years without failure for many applications such as marinas, gasoline stations and small power generators.

Cost Impact: The code change proposal will decrease the cost of construction. The use of a listed encasement system results in cost savings because the piping and encasement are installed simultaneously. This avoids the labor cost of separately installing the conduit and piping. In addition, the sealing and venting methods (when required) are also integrated within the encasement system, thus eliminating the need to separately assemble and/or install sealing and venting components within standard conduit.

Analysis: A review of the standards proposed for inclusion in the code, UL 971A -2006 and UL 1369-18, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 2, 2018.

F304-18

Public Hearing Results

Committee Action:

As Submitted

Committee Reason: This proposal was approved based upon the proponent's reason statement and would allow for another type of double contained pipe. (Vote: 14-0)

Assembly Action:

None

F304-18

Individual Consideration Agenda

Public Comment 1:

Proponent: CP28 Administration.

Commenter's Reason: The administration of ICC Council Policy 28 (CP28) is not taking a position on this code change. This public comment is being submitted to bring a procedural requirement to the attention of the ICC voting membership. In accordance with Section 3.6.3.1.1 of ICC Council Policy 28 (partially reproduced below), the new referenced standard UL1369-18: Aboveground Piping Requirements, must be completed and readily available prior to the Public Comment Hearing in order for this public comment to be considered.

(CP28) 3.6.3.1.1 Proposed New Standards. In order for a new standard to be considered for reference by the Code, such standard shall be submitted in at least a consensus draft form in accordance with Section 3.4. If the proposed new standard is not submitted in at least consensus draft form, the code change proposal shall be considered incomplete and shall not be processed. The code change proposal shall be considered at the Committee Action Hearing by the applicable code development committee responsible for the corresponding proposed changes to the code text. If the committee action at the Committee Action Hearing is either As Submitted or As Modified and the standard is not completed, the code change proposal shall automatically be placed on the Public Comment Agenda with the recommendation stating that in order for the public comment to be considered, the new standard shall be completed and readily available prior to the Public Comment Hearing

F304-18

F314-18

IFC: 5707.4

Proposed Change as Submitted

Proponent: Andrew Klein, representing Booster Fuels (andrew@asklein.com)

2018 International Fire Code

Revise as follows

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 unless adequate and direct access from grade-level is provided as determined by the fire code official.

Reason: There are some sites where a building or underground parking structure is below a grade-level parking lot. Fueling at such a location does not hinder emergency vehicle access, and fueling may be performed safely. This proposal provides the fire code official the ability to permit fueling at such locations when adequate emergency vehicle access is provided.

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This code change proposal simply clarifies where mobile fueling is permitted.

F314-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved based upon concerns related to the potential for the accumulation of vapors. A modification was presented that provided more detail regarding issues such as ventilation, location and spill control but further review is necessary. In particular it needs to be clear that all conditions presented by the modification would apply. (Vote: 14-0)

Assembly Action:

None

F314-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Andrew Klein, representing Booster Fuels and Shell (andrew@asklein.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

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.

Exception: The fire code official is authorized to permit mobile fueling inside and on the roof level of buildings and garages that are classified as Group H-3 in accordance with Section 307.5 of the International Building Code.

Commenter's Reason: There is an industry need for mobile fueling of fleet vehicles that are garaged in parking structures. As technology advances and cities look to reduce traffic congestion, fleets of vehicles owned by car sharing companies have increased dramatically in recent years. Gasoline is still the preferred fuel source for most of these vehicles, even the autonomous ones that are being developed and tested. Car sharing businesses need code requirements to support developing technology and city needs so that they can move forward with confidence investing in infrastructure.

Fueling inside of a building is no different than any other use of flammable liquids inside of a building. Permitting mobile fueling inside of buildings constructed as H-3 Occupancies is consistent with the intent of the Code and provides the necessary requirements and guidance when constructing facilities for such purposes.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

Jurisdictions may already permit fueling inside of buildings that are classified as Group H-3 occupancies through alternative means and methods. This Public Comment codifies what is already being done so that owners of ride sharing fleets can continue with confidence when expanding their fleets and the facilities that garage them.

F314-18

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: There was general concern for dispensing fuel on a public way. In particular there is concern for such operations occurring in residential neighborhoods without additional data to better understand the risks. It was pointed out that the language appears to limit time of day but not location. There was a sense from some that the fire code official should be allowed some discretion to allow fueling in public ways under certain conditions. (Vote: 11-3)

Assembly Action:

None

F316-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Andrew Klein, representing Shell (andrew@asklein.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

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.

Exception: The fire code official is authorized to permit mobile fueling on public streets and public ways where all of the following conditions are met:

1. Mobile fueling has been permitted by the authority having jurisdiction over public streets.
2. Mobile fueling activities do not obstruct vehicular or pedestrian traffic.
3. The safety and emergency response plan requires compliance with all applicable parking and traffic vehicle laws.

Commenter's Reason: Many jurisdictions rely on ride sharing programs to reduce congestion and eliminate the need for costly, expanded infrastructure improvements. In order for ride sharing programs to be viable, vehicles often need to be distributed throughout cities so that users of the program can access them. Fueling such vehicles presents many issues from rampant fraud and abuse of fuel cards to the inconvenience of members having to refuel at gas stations. When jurisdictions request that fueling of vehicles parked along the street be permitted, the Code must provide guidance to the fire code official as to how to permit such an activity.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The mobile fueling activities will not affect construction costs of buildings.

Public Comment 2:

Proponent: Jim Tidwell, representing FILLD (jimtidwell@tccfire.com) requests As Modified by This Public Comment.

Replace as follows:

2018 International Fire Code

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.

Exception: The Fire Code Official is authorized to permit mobile fueling on public streets where all the following apply:

1. The fueling operation is at an approved location or geographic area
2. The mobile fueling vehicle and the vehicle being fueled are in compliance with all parking, traffic and vehicle laws
3. The mobile fueling operation do not obstruct vehicle or pedestrian traffic
4. Containment for spilled fuel is in place while the fueling operation is in process
5. Approved overfill protection is provided
6. The mobile fueling vehicle is positioned with respect to the vehicle being fueled to prevent traffic from driving over the delivery hose
7. Fueling operations take place during a time of day and day of week approved by the fire code official

Commenter's Reason: While mobile fueling services are relatively new, they are quickly becoming highly desirable and, in many cases, a necessary part of our daily lives. The industry has now completed more than a million fueling events with no reportable spills, fires or other incidents related to the fueling activity. This is clearly an indication that mobile fueling is not a significant risk to our communities.

Our proposal to the code development committee was contained in a floor modification identical to this public comment. The proposal was recommended for disapproval by the committee, we believe, because there was a lack of information relative to the risks of mobile fueling. One of the challenges in developing regulations for new processes or activities is that we tend to address perceived risks, and don't have the data to base the requirements on actual risks. This was the case when the 2018 requirements were developed for mobile fueling and has persisted until now. To address this knowledge gap, we engaged Jensen Hughes to conduct a risk assessment of mobile fueling, and specifically asked them to analyze the practice of on-street fueling and compare that risk to the risks associated with fixed site (service station) fueling activities. The report is available by request to any jurisdiction wishing to view it, but is obviously too voluminous to include here.

Specific to this proposal are the following passages from the report:

The purpose of the report: "Specifically, the assessment compares the risks associated with fuel dispensing operations at a fixed motor fuel dispensing facility ("service station") that directly complies with the requirements of the applicable codes and standards, and a mobile fueling operation (as conducted by Filld) located on a public street."

"These results support the consideration that mobile fueling operations do not increase the fire risk to life and property beyond that already permitted by other fueling operations currently permitted in codes and standards."

The report goes on to state that "The results of the consequence analysis show that mobile fueling operations can limit the risk of property damage to a level that is at least as good as or better than that implicit to the spatial separation requirements of IFC and NFPA 30A for fixed dispensing facilities (3.0 m)."

Based upon the risk analysis, fires per fueling event involving mobile fueling are predicted to be less frequent than those at fixed facilities, and the result of any fire that does occur will be no more harmful than those emanating from fixed fueling facilities.

The report uses industry standard practices to calculate both frequency and severity of events. The calculations are based upon historical data gleaned from valid sources, including NFPA, International Association of Oil and Gas Producers, and the Petroleum Equipment Institute, to name a few. Utilizing historical data rather than relying upon theoretical failure rates adds credibility to the findings.

Even though we believe the practice of mobile fueling poses no additional risk to our communities, the proposed change provides ample opportunity for the code official to implement requirements specific to the jurisdiction, including location, time of day, day of week, etc. Because the proposal doesn't mandate the code official to permit mobile fueling on streets, additional requirements based upon the local risk profile and response capabilities may be implemented. For instance, meaningful distinctions between truck type, aggregate fuel capacity, and driver training and certification, among other factors, give rise to meaningful differences in hazard/risk profiles. This proposal provides for a reasonable level of safety while providing enough flexibility to the local code official to address local concerns.

We ask the ICC membership to carefully study this report, which clearly indicates that mobile fueling is at least as safe as currently permitted fixed site fueling. Based upon that fact, and based upon the fact that this proposal includes strict requirements for this activity, it would be inappropriate for the code to require a higher level of protection for a lower risk activity. Please vote in support of this public comment.

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

The proposal doesn't involve construction, therefore there can be no impact on the cost of construction.

F328-18

IFC: , O101, O101.1, O101.2, O101.3, O101.4, O101.5, O102

Proposed Change as Submitted

Proponent: Michael O'Brian, Chair, representing FCAC (fcac@iccsafe.org)

2018 International Fire Code

Add new text as follows

O101 QUALIFICATIONS

O101.1 Fire Marshal/Fire code official. The fire marshal/fire code official shall have experience as a firefighter or fire officer, architect, fire protection engineer, inspector, fire protection contractor or some combination of these fields. In addition, the fire marshal/fire code official shall have experience and/or formal training in supervisory skills. The fire code official shall be certified as a fire code official, fire marshal, or fire protection engineer through a recognized licensure or certification program. With the exception of architects and fire protection engineers, certification or licensure for fire marshal shall demonstrate the qualifications outlined in NFPA 1037. The fire marshal/fire code official shall be appointed or hired by the fire chief or executive management of the governing authority.

O101.2 Chief fire inspector. The fire marshal/fire code official is authorized to designate chief fire inspectors to serve as supervisors or fire service officers to administer the provisions of the International Fire Code and to supervise plans examiners and inspectors. Each supervisor or fire service officer in the role of chief fire inspector shall have experience as a firefighter or fire officer, architect, fire protection engineer, inspector, fire protection contractor, or some combination of these fields. In addition, when chief fire inspectors are appointed, they shall have experience or formal training in supervisory skills. The chief fire inspector shall be certified or licensed through a recognized licensure or certification program as a fire inspector, fire safety inspector, fire code plans examiner, fire protection engineer, or in an equivalent field of expertise. With the exception of architects and fire protection engineers, certification or licensure programs for chief fire inspector shall demonstrate qualifications in accordance with NFPA 1037 or NFPA 1031.

O101.3 Fire code plans examiner. The fire marshal/fire code official shall appoint or hire such number of officers, plans examiners, assistants and other employees as shall be authorized by the jurisdiction. To be appointed or hired as a fire code plans examiner experience as a firefighter, fire officer, fire inspector, building inspector/plans examiner, fire protection contractor, fire protection engineer or engineer in training, or architect is required. An Associate Degree in Fire Protection or Building Construction Technology shall be deemed an acceptable alternative for the necessary experience. The fire code plans examiner shall be certified or licensed through a recognized licensure or certification program as a fire code plans examiner, combination fire inspector/plans examiner, fire protection engineer, or in an equivalent field of expertise. With the exception of architects and fire protection engineers, certification or licensure programs for fire inspector or plans examiner shall demonstrate qualifications in accordance with NFPA 1031. Entry level employees or trainees shall be permitted to be hired and assigned to work under the direction and authority of the fire marshal/fire code official while obtaining the required experience and certification(s).

O101.4 Fire inspector. The fire marshal/fire code official is authorized to appoint or hire such number of officers, inspectors, assistants and other employees as shall be authorized by the jurisdiction. A person shall not be appointed or hired as fire code inspector who has not had experience as a firefighter, fire officer, fire protection contractor, fire protection engineer or engineer in training, or architect. Completion of 15 semester units or 22 quarter units from a recognized college in Fire Protection or Building Construction Technology shall be an acceptable alternative to the one year of experience. The fire code inspector shall be certified or licensed through a recognized licensure or certification program as a fire inspector, combination fire inspector/plans examiner, fire safety inspector, fire protection engineer, or in an equivalent field of expertise. With the exception of architects and fire protection engineers, certification or licensure programs for fire inspector or plans examiner shall demonstrate qualifications in accordance with NFPA 1031. Entry level employees or trainees shall be permitted to be hired and assigned to work under the direction and authority of the fire marshal/fire code official while obtaining the required experience and certification(s).

O101.5 Termination of employment. Employees in the position of fire marshal, fire code official, chief fire inspector, fire inspector, or fire code plans examiner shall not be removed from office except for cause after full opportunity has been given to be heard on specific charges before such applicable governing authority.

O102 REFERENCED STANDARDS

NFPA 1031-2014 Standard for Professional Qualifications for Fire Inspector and Plan Examiner

Reason: This proposed change is result of an evaluation of previous work by the CTC that was based on the “NIST Charleston Sofa Store Fire Recommendations”. This work and the follow-up work of the FCAC addresses the NIST and other investigative reports on the fire that occurred on the evening of June 18, 2007 in the Sofa Super Store in Charleston, South Carolina to identify issues that can be addressed by the International Codes.

In connection with their investigation, NIST analyzed the fire ground, consulted with other experts, and performed computer simulations of fire growth alternatives. Based on these analyses, NIST concluded that the following sequence of events is likely to have occurred. A fire began in packing material and discarded furniture outside an enclosed loading dock area. The fire spread to the loading dock, then into both the retail showroom and warehouse spaces. During the early stages of the fire in the two latter locations, the fire spread was slowed by the limited supply of fresh air. This under-ventilation led to generation of a large mass of pyrolyzed and only partially oxidized effluent. The smoke and combustible gases flowed into the interstitial space below the roof and above the suspended ceiling of the main retail showroom. As this space filled with unburned fuel, the hot smoke also seeped through the suspended ceiling into the main showroom and formed a hot smoke layer below the suspended ceiling. Up to this time, the extent of fire spread into the interstitial space was not visible to fire fighters in the store. If the fire spread had been visible to the fire fighters in the store, it would have provided a direct indication of a fire hazard in the showroom. Meanwhile, the fire at the back of the main showroom and the gas mixture below the suspended ceiling were both still fuel rich. When the front windows were broken out or vented, the inflow of additional air allowed the heat release rate of the fire to intensify rapidly and added air to the layer of unburned fuel below the suspended ceiling enabling the ignition of the unburned fuel/air mixture. The fire swept from the rear to the front of the main showroom extremely quickly, and then into the west and east showrooms. Nine fire fighters were killed in the Sofa Super Store fire. NIST developed eleven recommendations to help mitigate such future losses.

Recommendation 3 of the NIST report reads as follows:

“Qualified Fire Inspectors and Building Plan Examiners: NIST recommends that all state and local jurisdictions ensure that fire inspectors and building plan examiners are professionally qualified to a national standard such as NFPA 1031 Standard for Professional Qualifications for Fire Inspector and Plan Examiner. Professional qualification may be demonstrated through a nationally accepted certification examination, such as the Fire Plan Examiner; Fire Inspector I and II, and Certified Fire Marshal.”

Following a review of recommendation 3 of the NIST report a new Appendix K is proposed. This proposal is similar in scope and intent to Section A101.3 of Appendix A of the International Building Code where suggested qualifications for building official, chief inspector, inspector and plan examiner are established.

The purpose of this proposal is to provide optional criteria for qualifications of employees who enforce the Fire Code through inspections and plan examinations. A jurisdiction that wants to make this appendix a mandatory part of the code would need to specifically list this appendix in its adoption ordinance. In recognition of the fact that some jurisdictions are mandated by applicable state law to employ only persons licensed by the state to perform certain duties, the proposal was drafted as an Appendix.

This proposal would not require fire inspectors or fire plan examiners to have had previous experience in Fire Code enforcement, but would merely require that they possess experience in a related job category. As with the efforts by the CTC, it is not the intent of the FCAC to prohibit a plan review and inspection staff from hiring and training entry level employees. The training of such entry level should simply be supervised by trained and certified personnel.

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 2017 the Fire-CAC has held 3 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The code change proposal will not increase or decrease the cost of construction. This proposal should not have any direct impact on the cost of construction. This proposal deals with the jurisdiction that serves as the authority having jurisdiction and the qualifications of personnel involved with applying and enforcing the fire code. If there are any cost impacts to construction it would possibly be the permitting costs necessary to adequately staff the fire code enforcement authority with qualified personnel.

Public Hearing Results

Committee Action:

Disapproved

Committee Reason: This proposal was disapproved as it was felt better addressed by human resources. In addition, there was not a direct connection made by NIST from the Charleston fire regarding qualification requirements by the jurisdiction. The state fire marshal's office may have specific requirements which may conflict with this appendix. Also, the legal language regarding termination appears beyond the scope of the IFC. Some did support the concept since this provides some guidance and as this is an appendix would have to be specifically adopted to apply. (Vote: 8-6)

Assembly Action:

None

F328-18

Individual Consideration Agenda

Public Comment 1:

Proponent: Michael O'Brian, FCAC, representing FCAC (fcac@iccsafe.org) requests As Submitted.

Commenter's Reason: As noted in the reason statement for the original proposal, this proposed change was the result of an evaluation of previous work by the Code Technology Committee (CTC) based on the "NIST Charleston Sofa Store Fire Recommendations". This work and the follow-up work of the FCAC addresses the NIST and other investigative reports on the fire that occurred on the evening of June 18, 2007 in the Sofa Super Store in Charleston, South Carolina to identify issues that can be addressed by the International Codes.

NIST analyzed the fire ground, consulted with other experts, and performed computer simulations of fire growth alternatives. Based on these analyses, NIST reached conclusions concerning the sequence of events likely to have occurred and developed eleven recommendations to help mitigate such future losses.

Recommendation 3 of the NIST report read as follows:

"Qualified Fire Inspectors and Building Plan Examiners: NIST recommends that all state and local jurisdictions ensure that fire inspectors and building plan examiners are professionally qualified to a national standard such as NFPA 1031 Standard for Professional Qualifications for Fire Inspector and Plan Examiner. Professional qualification may be demonstrated through a nationally accepted certification examination, such as the Fire Plan Examiner; Fire Inspector I and II, and Certified Fire Marshal."

Following a review of recommendation 3 of the NIST report and previous work by the CTC, the FCAC developed a new Appendix O and submitted the proposal. The intent and content of the proposal is similar to Section A101.3 of Appendix A of the International Building Code where suggested qualifications for building official, chief inspector, inspector and plan examiner are established.

The purpose of the submitted proposal was and is to provide optional criteria for qualifying employees who enforce the Fire Code through inspections and plan examinations in order to help ensure that the design, construction, and maintenance of buildings and structures are verified by personnel capable of detecting and requiring the correction of code violations. These criteria are similar to the personnel qualifications of NFPA 1730 "Standard on Organization and Deployment of Fire Prevention Inspection and Code Enforcement, Plan Review, Investigation, and Public Education Operation", NFPA 1031 "Standard for Professional Qualifications for Fire Inspector and Plans Examiner", and NFPA 1037 "Standard on Fire Marshal Professional Qualifications". The major difference is that the proposal gives emphasis to certification or licensure which would bring some level of credibility and independent verification of those qualifications. As noted in the proposal's reason statement, a jurisdiction that wants to make this appendix a mandatory part of the code would need to specifically list this appendix in its adoption ordinance. The proposal was drafted as an Appendix at least in part in recognition of the fact that some jurisdictions are mandated by applicable state law to employ only persons licensed by the state to perform certain duties.

The proposal as submitted would not require fire inspectors or fire plan examiners to have had previous experience in Fire Code enforcement, but would merely require that they possess experience in a related job category. As noted in the proposal's reason statement, it was not and is not the intent of the FCAC to prohibit a plan review and inspection staff from hiring and training entry level employees. The training of such entry level personnel should simply be supervised by trained and certified personnel.

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 2017 the Fire-CAC has held 3 open meetings and in 2018 FCAC held 2 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: <https://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/>

Cost Impact: The net effect of the public comment and code change proposal will not increase or decrease the cost of construction

This proposal should not have any direct impact on the cost of construction. This proposal deals with the jurisdiction that serves as the authority having jurisdiction and the qualifications of personnel involved with applying and enforcing the fire code. If there are any cost impacts to construction it would possibly be the permitting costs necessary to adequately staff the fire code enforcement authority with qualified personnel.

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