Code Review
2018 Changes to International Codes

FLORIDA BUILDING COMMISSION
"Stronger Codes Through Science and Consensus"

Florida dbpr
Building Codes and Standards

International Fire Code(IFC) / International Building Code (IBC) – Fire Prevention

Fire Technical Advisory Committee (TAC)

IBC- Code Change No.	IBC- Section	Change Summary b/t 2015 IBC and 2018 IBC – Fire TAC	Change Summary b/t 2017 FBC and 2018 IBC.	Staff comments
F12-16	903.2.11.1.1 (IBC [F] 903.2.11.1.1), 903.2.11.2 (IBC [F] 903.2.11.2), 904.12.4 (IBC [F] 904.12.4), 905.5 (IBC [F] 905.5), 906..5 (IBC [F] 906.5), 907.2 (IBC [F] 907.2), 907.2.6 (IBC [F] 907.2.6), 907.2.6.3.3 (IBC [F] 907.2.6.3.3), 907.2.10.1 (IBC [F] 907.2.10.1), 907.2.20 (IBC [F] 907.2.20), 907.2.22.2 (IBC [F] 907.2.22.2), 907.4.2.6 (IBC [F] 907.4.2.6), 907.8.2 (IBC [F] 907.8.2), 909.12.4 (IBC [F] 909.12.4, IMC [F]	Revises section 303.2.11.1.1 “Opening dimensions and access,” revises section 903.2.11.2 “Rubbish and linen chutes,” revises section 904.12.4 “Special provisions for automatic sprinkler systems,” revises section 905.5 “Location of Class II standpipe hose connections,” revises section 906.5 “Conspicuous location,” revises section 907.2 “Where required—new buildings and structures,” revises section 907.2.6 “Group I,” revises section 907.2.6.3.3 “Automatic smoke detection system,” revises section 907.2.10.1 “Manual fire alarm system,” revises section 907.2.20 “Covered and open mall buildings,” revises section 907.2.22.2 “Other airport traffic control towers,” revises section 907.4.2.6 “Unobstructed and unobscured,” revises section 907.8.2 “Testing,” revises section 909.12.4 “Automatic control,” revises section 910.4.5 “Manual control location,” revises section 3313.1 “Where required,” revises section 513.12.4 IMC and revises section 403.1 “Restricted Access” to provide a change in terminology for clarity purposes. This amendment was approved as modified per public comment by Michael O’Brian to provide further clarity. **Cost Impact:** Will not increase the cost of construction. This is a change in terminology for **clarity** and will have not technical changes to the codes.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

	513.12.4), 910.4.5 (IBC [F] 910.4.5), 3313.1 (IBC [F] 3311.1, IEBC [F] 1506.1), 109.1.1, [F] 403.1			

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F14-16	311.2.2, 503.6, 508.1.1, 907.5.1 (IBC [F] 907.5.1), 909.15 (IBC [F] 909.15), 912.2 (IBC [F] 912.2), 912.2.1(IBC [F] 912.2.1), 912.4 (IBC [F] 912.4), 912.4.2 (IBC [F] 912.4.2), 3209.4, B103.1, B103.2, D103.2, L104.14.1; IBC [F] 403.4.6, [F] 911.1.1	Revises sections to provide consistency when approval is needed for items utilized during firefighting operations. The IFC and IBC both contain requirements where either the "fire code official", or the "fire chief", or the "fire department" needs to provide approval. **Cost Impact:** Will not increase the cost of construction. This is only a **change in terminology.**	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F44-16	508.1.3, IBC [F] 911.1.3	Revises section 508.1.3 (IBC [F] 911.1.3) "Size," to keep the current minimum fire command room size as it currently exists in the code. This amendment was approved as modified by the public comment of Stephen DiGiovanni. **Cost Impact: Will increase the cost of construction.** This amendment will have varying effects on construction (both increase and decrease), as some buildings (those less than 1,333,333 sf in building area) would be able to use smaller Fire Command Centers than are currently required, while other buildings (those larger than 1,333,333 sf in building area) would be required to have larger Fire Command Centers than are currently required.	Same as change between 2015 IBC and 2018 IBC	

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F56-16	IBC [F] 2702.2.3	Revises section (IBC [F] 2702.2.3) "Emergency responder radio coverage systems" to appropriately bring the power supply requirements in line with that which is required for fire alarm system. **Cost Impact:** Will not increase the cost of construction. It will significantly **reduce the cost of** the system since the	Same as change between 2015 IBC and 2018 IBC	

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		proposed 12-HR UPS power back up system is less costly than the currently required 24-HR UPS system.		

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F57-16	IBC [F] 2702.2.3	Revises section (IBC [F] 2702.2.3) "Emergency responder radio coverage systems," to allow the use of available standby power generators in lieu of 12 hours provided strictly from batteries. **Cost Impact:** Will not increase the cost of construction. This proposal **will reduce the cost** of construction.	Same as change between 2015 IBC and 2018 IBC	

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F75-16	105.7.9 (New), 202, 202 (New), 604.2.6 (New) (IBC [F] 2702.2.6 (New)), 606.8, 606.8.1 (New), 901.5, 901.6, 902.1, 908.1 (IBC [F] 908.1), 908.2	Adds new section 105.7.9 "Gas detection systems," deletes without substitution section 202 definition of "Continuous gas detection system," adds new section 202 definition of "Gas detection system," adds new definition of "HPM," adds new section 604.2.6 (IBC [F] 2702.2.6) "Gas detection systems," revises section 606.8 "Refrigerant detection," adds new section 606.8.1 "Refrigerants other than ammonia," revises section "901.5 Installation acceptance testing," revises section 901.6 "Inspection, testing and maintenance," adds new definitions to Chapter 2, revises section	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

	(IBC [F] 908.2), 908.3 (IBC [F] 908.3)] 908.3.1 (IBC [F] 908.3.1), 908.3.2 (IBC [F] 908.3.2), 908.3.3 ([F] 908.3.3), 908.4 (IBC [F] 908.4), 908.5 (IBC [F] 908.5), 908.6 (IBC [F] 908.6), 908.7 (IBC [F] 908.7), 916.(New) (IBC [F] 916 (New)), 6204.1.11; IBC [F] 406.8.5, [F] 406.8.5.1, [F] 406.8.5.1.1, [F] 406.8.5.2, [F] 406.8.5.3, [F] 415.2, [F] 415.11.7, [F] 415.11.7.1, [F] 415.11.7.1.1, [F] 415.11.7.1.2, [F] 415.11.7.1.3, [F] 415.11.7.1.4, [F] 415.11.7.2, [F] 415.11.9.3, [F] 421.6, [F]	908.1 "Group H occupancies" revises section 908.2 "Group H-5 occupancy," deletes without substitution sections 908.3 "Highly toxic and toxic materials," section 908.4 "Ozone gas-generator rooms," section 908.6 "Refrigeration systems," section 908.7 "Carbon dioxide (CO2)," adds new section 916.1 "Gas Detection Systems," section 916.2 "Permits," section 916.3 "Equipment," section 916.4 "Power Connections," section 916.5 "Emergency and standby power," section 916.6 "Sensor Locations," revises section 6204.1.11 "Standby power," revises section [F] 406.8.5 "Gas detection system," revises section [F] 406.8.5.1 "Operation System activation," revises section [F] 406.8.5.2 "Failure of the gas detection system," deletes without substitution sections [F] 406.8.5.1 "System design," section [F] 406.8.5.1.1 "Gas detection system components," revises section [F] 415.11.7 "Gas detection systems," revises section [F] 415.11.7.1 "Where required," revises section [F] 415.11.7.1.1 "Fabrication areas," revises section [F] 415.11.7.1.2 "HPM rooms," revises section [F] 415.11.7.1.3 "Gas cabinets, exhausted enclosures and gas rooms," [F] 415.11.7.1.4 "Corridors," revises section [F] 415.11.7.2 "Gas detection system operation," section [F] 415.11.7.1.3 "Gas cabinets, exhausted enclosures and gas rooms," section [F] 15.11.7.1.4 "Corridors," section [F] 415.11.7.2 "Gas detection system operation," section [F] 415.11.9.3 "Signals," section [F] 421.6 "Gas detection system," section [F] 421.6.1 "Operation System activation," deletes without substitution section [F] 421.6.1 "System design," revises section 421.6.2 "Failure of the gas detection system," and deletes without substitution section [F] 421.6.2 "Gas detection system components," to clarify gas detection system requirements. This amendment was approved as modified by the public comment of Jeffrey Shapiro.		

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	421.6.3, [F] 421.6.1, [F] 421.6.4, [F] 421.6.2	**Cost Impact: Will increase the cost of construction.** The additional construction requirements in this proposal have the potential to increase construction costs. However, since the features described in Section 916 are currently available with most gas detection equipment on the market today, the additional costs may not be significant and/or construction of walls not necessary for fire or life safety.		

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F79-16	(IBC [F] 2702.1.2) (New)	Adds new section 2702.1.2 “Fuel Line piping protection” to require fuel lines supplying a generator set inside a building to be separated with fire resistance- rated construction from areas of the building other than in the room in which the generator is located. **Cost Impact: Will increase the cost of construction.** This requirement for protection of the fuel lines supplying stationary generators already applies to high-rise buildings. This proposal, if approved, would require labor to install generic materials or a proprietary system to protect fuels lines in all buildings with stationary generators.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F95-16	907.2.23 (IBC [F] 907.2.23); IBC [F] 307.1.1,	Revises section [F] 307.1.1 “Uses other than Group H,” and revises section 907.2.23 “Battery rooms,” to introduce a number of new requirements that cover stationary storage battery installations that were previously largely unregulated. This proposal was approved as modified by public comment 2 from Michael O'Brian. **Cost Impact: Will increase the cost of construction.** This proposal introduces a number of new requirements that cover stationary storage battery installations that were previously largely unregulated.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F111-16	[F] 307.1.1	Revises section [F] 307.1.1 “Uses other than Group H,” to identify that the separation requirements for stationary fuel cell power systems in incidental use areas of buildings was not properly addressed. This proposal was approved as modified by public comment 1 from Michael O'Brian. **Cost Impact: Will increase the cost of construction.** There are no requirements in the code that specifically	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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		regulate these systems. Complying with the proposed requirements will result in increased construction and maintenance expenses.		

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F112-16	[IBC:[F] 907.2.24(New)], IBC; [F] 307.1.1,	Revises section 907.2.24 (IBC [F] 907.2.24) "Capacitor energy storage systems," and revises section [F] 307.1.1 "Uses other than Group H," to introduce a number of new requirements for capacitor energy storage system installations that were previously unregulated. **Cost Impact:** **Will increase the cost of construction.** This proposal introduces a number of new requirements for capacitor energy storage system installations that were previously unregulated.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

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F130-16	(IBC [F] 806.1)	Revises section 806.1 "Decorative Materials and Trim" to provide clarification. **Cost Impact:** Will not increase the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

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F134-16	(IBC [F] 806)	Revises section 806 "Decorative Materials and Trim" to provide clarification with regard to the application of the requirements of combustible decorative materials. **Cost Impact:** This proposal will not increase the cost of construction. In fact, it **will reduce the cost** of construction in those occupancies which do not need to comply.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F135-16	(IBC: [F] 806.3)	Revises section 806.3 Combustible decorative materials to provide clarity for Group I-3 occupancies and more flexibility for window coverings. **Cost Impact:** Will not increase the cost of construction. The proposal will **provide clarity** for Group I-3 occupancies and more flexibility for window coverings, therefore there are **no cost impacts** associated with this proposal.	Same as change between 2015 IBC and 2018 IBC	

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F141-16	901.4.6, 903.3, 903.3.6 (IBC [F] 903.3.6) (New), 903.3.6.1 (IBC [F] 903.3.6.1) (New), 903.3.6.2 (IBC [F] 903.3.6.2) (New), 903.3.6.3 (IBC [F] 903.3.6.3) (New), 903.3.6.4 (IBC [F] 903.3.6.4) (New), 903.3.6.5 (IBC [F] 903.3.6.5) (New), 903.3.6.6 (IBC [F] 903.3.6.6) (New), 903.3.6.7 (IBC [F] 903.3.6.7) (New)	Adds new section 903.3.6 (IBC [F] 903.3.6) "Fire sprinkler riser rooms," adds new section 903.3.6.1 (IBC [F] 903.3.6.1) "Size," adds new section 903.3.6.2 (IBC [F] 903.3.6.2) "Working space," adds new section 903.3.6.3 (IBC [F] 903.3.6.3) "Exterior Access Door," adds new section 903.3.6.4 (IBC [F] 903.3.6.4) "Marking on access doors," adds new section 903.3.6.5 (IBC [F] 903.3.6.5) "Equipment access," adds new section 903.3.6.6 (IBC [F] 903.3.6.6) "Environment," adds new section 903.3.6.7 (IBC [F] 903.3.6.7) "Lighting" to provide a minimum level of protection and location for fire sprinkler risers. This proposal provides a minimum level of protection and location for fire sprinkler risers.. The proposal was approved as modified. The modification was approved because it was decided by the committee that the same room requirements that are required for fire pump rooms should also be required for automatic sprinkler riser rooms.. **Cost Impact: Will increase the cost of construction** This proposal will result in a minimal increase to the cost of construction to provide a riser room of 16 square feet.	Same as change between 2015 IBC and 2018 IBC	

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		☐ No Action Needed	☐	☐	
		☐ Overlapping provisions	☐	☐	

F145-16	[IBC [F] 202, [F] 901.6.2 (New), [F] 901.6.2.1 (New), [F] 901.6.2.2 (New)	Adds new section 202 definition of "INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEM TESTING," adds new section 202 definition of "SUBORDINATE (SYSTEM)," adds new section "901.6.2 Integrated Testing," adds section 901.6.2.1 "General," adds new section 901.6.2.2 "Smoke Control Systems," adds new section 901.6.2.2 "High-rise buildings," and adds new referenced standard NFPA 4-2015 "Standard for Integrated Fire Protection and Life Safety System Testing," Referenced in Section 901.6.2.2 to require proper operation of integrated features of fire-protection and life-safety systems. This proposal was approved as modified. **Cost Impact: Will increase the cost of construction.** Although it is currently the intent of the IFC for fire-protection and life-safety systems to be thoroughly tested, including ensuring that integrated systems and features work properly, this requirement has not been previously addressed by specific code text. Accordingly, adding a specific requirement for integrated testing might arguably be regarded as having a construction cost impact. In addition, specifically with respect to high-rise buildings, the required planning and execution of integrated testing to comply with NFPA 4 will likely increase the cost of building commissioning tests.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F152-16	903.2.1(IBC [F] 903.2.1), 903.2.1.1 (IBC [F] 903.2.1.1), 903.2.1.2 (IBC [F] 903.2.1.2), 903.2.1.3 (IBC [F] 903.2.1.3) , 903.2.1.4 (IBC [F] 903.2.1.4) , 903.2.1.5 (IBC [F] 903.2.1.5)	Revises section 903.2.1 "Group A," revises section 903.2.1.1 "Group A-1," revises section 903.2.1.2 "Group A-2," revises section 903.2.1.3 "Group A-3," and revises section 903.2.1.4 Group A-4 to remove inconsistencies within code sections. **Cost Impact:** Will not increase the cost of construction. This proposal **clarifies** existing code provisions and will have no effect on the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F153-16	(903.2.1.5 (IBC [F] 903.2.1.5), 903.2.1.5.1 (New) [IBC [F] 903.2.1.5.1 (New)], IBC 1029.1.1.1	Revises section 903.2.1.5 "Group A-5," adds new section 903.2.1.5.1 "Spaces under grandstands or bleachers," revises section 304.1.3 "Space underneath seats," adds new section "304.1.3.1 Spaces underneath grandstand," and revises section 1029.1.1.1 "Spaces under grandstands and bleachers" to correlate the grandstand and bleacher requirements between the IFC and IBC. **Cost Impact:** Will not increase the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		Both requirements are established in each code. This proposal pulls together the active and passive requirements.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F154-16	903.2.2 (IBC [F] 903.2.2)	Revises section 903.2.2 “Ambulatory care facilities” to provide protection from issues below the nearest level of exit discharge. **Cost Impact: Will increase the cost of construction** Increasing sprinkler coverage below the level of exit discharge will add the cost of sprinklers. The total cost will vary per building and design. The total cost will vary per building and design. On hilly sites where there may be several floors below the LED, the cost will be more extreme. The cost impact to existing tenants by adding sprinklers should be considered as well. Some building may be ruled out by tenants due to lack of sprinkler coverage.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F157-16	903.2.3 (IBC [F] 903.2.3)	Revises section 903.2.3 “Group E” to provide for a fire sprinkler trigger in Group E occupancies based on occupant load. This proposal was further modified by public comment which further adjust the occupant load for triggering fire sprinkler requirement. **Cost Impact: Will increase the cost of construction.** Will require a fire sprinkler system installation in many education buildings that are currently not required by the IFC to have fire sprinkler protection.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F163-16	903.2.11.1 (IBC [F] 903.2.11.1)	Revises section 903.2.11.1 “Stories without openings” to provide language that clarifies the intended requirements by removing the double negative that is found in the current code section. **Cost Impact:** Will not increase the cost of construction. This is simply **language change** and would not increase construction.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F165-16	903.3.1.1.2 (IBC [F] 903.3.1.1.2)	Revises section 903.3.1.1.2 “Bathrooms” to remove the requirement for sprinklers in bathrooms of group R-4 occupancies. **Cost Impact:** Will not increase the cost of construction. This is a **reduction in** sprinkler coverage **requirements** from current code.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F170-16	903.3.1.2.1 (IBC [F] 903.3.1.2.1)	Revises section 903.3.1.2.1 “Balconies and decks” to correlate with the balcony sprinkler requirements in Section 1406.3. This proposal was approved as modified by public comment submitted by Jeffrey Shapiro. **Cost Impact:** Will not increase the cost of construction. This proposal **does not add any new requirements** and therefore will not increase the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F172-16	903.3.1.2.3 (New) (IBC [F] 903.3.1.2.3 (New)), 903.2.8.3 ([F] 903.2.8.3) , 903.2.8.3.1 (IBC [F] 903.2.8.3.1), 903.2.8.3.2 (IBC [F] 903.2.8.3.2)	Adds new section 903.3.1.2.3 “Attics,” revises section [F] 903.2.8.3 “Group R-4 Condition 2,” deletes section [F] 903.2.8.3.1 “Attics used for living purposes, storage or fuel-fired equipment,” and deletes section [F] 903.2.8.3.2 “Attics not used for living purposes, storage or fuel-fired equipment” to increase fire protection in attics. This proposal is recommended as a response to fire-service concerns about suppressing a fire involving a tall pedestal building attic. The code change was further modified by the Committee to extend the new requirements to Type IV in addition to Types III and V construction buildings. **Cost Impact:** **Will increase the cost of construction.** The added requirement for attic protection will increase the cost of construction for affected buildings.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F174-16	904.12 (IBC [F] 904.12)	Revises section 904.12 “Commercial cooking systems” and adds new standard “NFPA 96-2014 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations” to clarify the use of the appropriate NFPA Standard. **Cost Impact:** Will not increase the cost of construction. This language is **editorial** in nature to clarify the use of the appropriate NFPA Standard.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.	
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐	
		☐ Overlapping provisions	☐	☐	

F175-16	904.12 (IBC [F] 904.12)	Revises section 904.12 “Commercial cooking systems” to provide another suppression option. **Cost Impact:** Will not increase the cost of construction. This only **provides another suppression option** and would not increase the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.	
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐	
		☐ Overlapping provisions	☐	☐	

F176-16	904.13.2 (IBC [F] 904.13.2), 906.1 (IBC [F] 906.1), 906.4 (IBC F] 906.4)	Revises section 906.1 “Where required,” revises section 906.4 “Cooking grease equipment fires to move the already existing requirements from one code section to another. **Cost Impact:** Will not increase the cost of construction. This **simply moves** the already existing requirements from one code section to another no substantive changes were made.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F177-16	IBC [F] 904.13, IBC [F] 904.13.1, IBC [F] 904.13.2	Modified text of Section 904.13 “Domestic cooking systems in Groups I-1 or I-2 Condition 1”, 904.13.1 “Manual system operation and interconnection”, 904.13.2 “Portable fire extinguishers”. This is coordination with G123-15(AS) and M45-15(AS). G 123-15 added criteria for domestic cooking in Group I-1 areas with a limited number of residents. M45-15 added a reference to this section for hoods in both Group I-1 and I-2. Section 904.13.2 is a subsection of 904.13, so the group does not have to be in the title. In addition, the group is not in the text **Cost Impact**: Will not increase the cost of construction. This **clarification** that will most likely reduce the cost of the hoods required.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F178-16	IBC [F] 904.13	Modifies text of Section 904.13 “Domestic cooking systems in Group I-2 Condition 1”. NFPA 96 allows for recirculating hoods in commercial kitchens. These kitchens are not commercial cooking, but are limited to domestic cooking for a limited number of residents. This will not be a health issue for residents, but is needed to allow for flexibility in design of these spaces. The aromas of cooking are one of the primary benefits for allowing kitchens in these home-like environments. **Cost Impact**: Will not increase the cost of construction. This	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		will be either a reduction or **no change to** construction requirements for venting.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need:	**Accommodate Florida Specific Need:**			
YES (Select Criteria) ☐ NO: ☐	YES (Select Criteria) ☐ NO: ☐	☐ No Action Needed	☐	☐
a.☐ b.☐ c.☐ d.☐ e.☐ f.☐	a.☐ b.☐ c.☐ d.☐ e.☐ f.☐	☐ Overlapping provisions	☐	☐
Others (Explain):	**Others (Explain):**			

F179-16	IBC [F] 904.13, IBC [F] 904.13.1, IBC [F] 904.13.1.1, IBC [F] 904.13.1.2 (New), IBC [F] 904.13.2	Modifies text of Section 904.13 “Domestic cooking systems”, 904.13.1 “Protection from fire”, 904.13.2 „Portable fire extinguishers”. Adds new Section 904.13.1.1 “Automatic fire-extinguishing system”, 904.13.1.2 “Ignition prevention”. Group A code proposals G 105-15 and G 121-15 were approved as submitted. These proposals covered the use of domestic cooking systems in Group I-2, Condition 1 occupancies and Group R-2 college dormitories. The reason statements for both proposals references that changes were needed to IBC/IFC Section 904.13 to provide correlation. This proposal provides this correlation, and makes no substantive changes to the existing Section 904.13 requirements **Cost Impact**: Will not increase the cost of construction. This proposal **provides correlation** with new IBC requirements for the domestic cooktops used in non-household occupancies. The option to use cooktops with ignition resistant burners in lieu of an automatic extinguishing system has the potential to actually reduce the cost of construction in these occupancies.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need:	**Accommodate Florida Specific Need:**			
YES (Select Criteria) ☐ NO: ☐	YES (Select Criteria) ☐ NO: ☐	☐ No Action Needed	☐	☐
a.☐ b.☐ c.☐ d.☐ e.☐ f.☐	a.☐ b.☐ c.☐ d.☐ e.☐ f.☐	☐ Overlapping provisions	☐	☐
Others (Explain):	**Others (Explain):**			

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F180-16	IBC [F] 904.13 (New)	Adds new Section 904.13 “Aerosol Fire Extinguishing Systems”, adds new standard “NFPA 2010, Edition 2015, Standard for Fixed Aerosol Fire-Extinguishing Systems”. In 2006, the NFPA 2010 (Edition 2006) Standard for Fixed Aerosol Fire Extinguishing Systems was first published. In 2011, the International Code Council Evaluation Service published the ICC-ES Acceptance Criteria for Fixed Condensed Aerosol Fire-Extinguishing Systems AC432. In 2013, the New York City Fire Code was amended to modify Section FC 904 FIRE EXTINGUISHING SYSTEMS to include a new subsection 904.13 Aerosol Fire Extinguishing Systems that comply with NFPA 2010 (current Edition 2015). In 2014, the ICC-ES published its first Division: 21 00 00 Fire Suppression, Section 21 22 18 Fixed Condensed Aerosol Extinguishing System Units evaluation report ESR-3230 for an aerosol fire suppression system in compliance with IFC 2009 and IFC 2012 as an alternative to IFC 904.9 Halon Fire Extinguishing Systems. In 2014, ANSI approved UL standard UL 2775 Standard for Fixed Condensed Aerosol Extinguishing System Units. **Cost Impact**: Will not increase the cost of construction. Condensed aerosol fire suppression systems used as total flooding systems for the protection of Class A (surface), Class B, and Class C hazards **can reduce construction, installation, and maintenance costs** compared with existing fire suppression systems. This technology does not use compressed gas cylinders nor pressure rated piping. Generally these systems are electrically operated when integrated with ICC IFC approved fire alarm and releasing control systems and approved/listed releasing panels, or are deployed as automatic stand-alone fire extinguishing units. Typically these extinguishing units are designed as disposable devices with a minimum 10 year shelf life. As there are no piping distribution systems required, no special storage requirements for compressed gas bottles, and the ability of the flooding agent to protect areas with limited leakage, the construction costs involving these systems are typically lower than conventional chemical and gas fire extinguishing systems requiring gas pressure.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		Furthermore the technology remains effective even with leakage in the space, and therefore offers an alternative fire suppression technology for existing installations involving reconstruction or new construction of areas with special hazards, and where total room integrity construction is problematic. As the units are designed to be disposable, generally they require very little maintenance and consequently offer low long term life cycle costs to facility operators.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

F183-16	IBC [F] 905.12 (New)	Adds new Section 905.12 “Locking Standpipe Outlet Caps”. Standpipe connection caps are vulnerable to theft. Vandalism is a concern when trash and debris are introduced into the outlet. The debris will flow directly to the fire fighters nozzle creating a life safety issue for fire fighters. The other problem that exists is with dry systems. When one or more valves are open within the system, and the fire department pumps to the system, the correct flow and pressure will not reach the fire fighters, causing a delay in the application of water. This delay can create increased property damage and life safety issues. This provision, when applied, will require the protected FDC and protected standpipe caps to have a compatible and standard opening mechanism. Approved as modified, to edit language in the original proposal. **Cost Impact**: **Will increase the cost of construction**. The cost is $103.00 per outlet protected. In a normal highrise with two stairs the cost would be $206.00 per floor.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.	
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐	
		☐ Overlapping provisions	☐	☐	

F184-16	IBC [F] 905.3.1	Modifies text of Section 905.3.1 “Height”. The current requirements for the need for standpipes is based upon the distance from the lowest level of FD vehicle access to the floor level of the highest story or the converse condition. Since the fire department is the primary user of standpipes, the ability to stretch hoselines should be the priority in developing requirements based on height. For every landing that the FD needs to stretch a hoseline around when advancing it from the ground level, it delays deployment for firefighting operations and requires additional personnel to complete it effectively. Furthermore, having a more consistent requirement based on the building rather than differences in height measurement is beneficial to firefighters during initial building size-up. The code change was further modified by the Committee. The modification was approved because the deletion of the word "one" makes it clear that having more than one of the listed conditions will still require the installation. **Cost Impact**: **Will increase the cost of construction.** This proposal will increase the cost of construction for unsprinklered buildings that are four stories and previously were arranged to stay below the 30 foot requirement since a Class III standpipe will need to be installed. This proposal will increase the cost of construction for sprinklered buildings that are four stories and previously were arranged to stay below the 30 foot requirement since Class I FD hose outlets and larger riser piping will be to be installed.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F185-16	IBC [F] 905.3.1	Modifies text of Section 905.3.1 "Height". The purpose of this code change proposal is to have a discussion on the need for occupant-use hose in Group B and E occupancies. The proposal is written to remove the occupant-use hose from these occupancies by switching from a Class III to a Class I standpipe system in these occupancies. Approved by public comment to rearrange the text of the mod. **Cost Impact**: Will not increase the cost of construction. The removal of the requirements for occupant-use hose **will save on the cost of construction** and maintenance of the hose systems.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F187-16	IBC [F] 905.4	Modifies text of Section 905.4 "Location of Class I standpipe hose connections". This change is proposed in order to make the hose valve location requirements consistent with current requirements in NFPA 14. NFPA 14 requires hose valves to be located at the main floor landing. Approved as modified to change the text of the mod. The modification was approved because the deleted text is unnecessary with the change in the location requirement. **Cost Impact**: Will not increase the cost of construction. This change **will reduce the cost** by not requiring the additional risers necessary to install hose outlets at intermediate landings	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action **Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	**Commission Action** **Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	☐ **No Action Needed** ☐ **Overlapping provisions**	**TAC** ☐ ☐	**Cmsn.** ☐ ☐
F188-16	IBC [F] 905.4	Modifies text of Section 905.4 “Location of Class I standpipe hose connections”. Adds an exception. Correlation with NFPA 14-2016 Section 7.3.2.5. The provision recognizes that there is no significant value to having two standpipes located at opposite ends of an open breezeway or corridor that connects to open stairs since both standpipes are essentially sharing the same environmental space. **Cost Impact**: Will not increase the cost of construction. The proposal will not increase the cost of construction. This is a **clarification** of the requirements of the current code.	Same as change between 2015 IBC and 2018 IBC	

TAC Action **Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	**Commission Action** **Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	☐ **No Action Needed** ☐ **Overlapping provisions**	**TAC** ☐ ☐	**Cmsn.** ☐ ☐
F190-16	IBC [F] 906.1	Modifies text of Section 906.1 “Where required”. Schools are now required to develop lock down plans to protect students and faculty from intruders. The plans effectively prevent access to portable extinguishers normally located in hallways during lockdown situations. Locating extinguishers in classrooms provides accessibility during normal conditions as well as when a school is forced into lockdown. This change provides an option for schools implementing lockdown plans to relocate extinguishers from hallways to classrooms. This is an option, not a requirement.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		Cost Impact: Will not increase the cost of construction. This change will **provide an option** to schools, and is not a requirement; as such, the school management is empowered to make the best decision based upon their individual needs.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: **YES (Select Criteria)** ☐ **NO:** ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

F192-16	IBC [F] 907.1.2, IBC [F] 907.1.3 (New))	Modifies text of Section 907.1.2 “Fire alarm shop drawings”. Adds new text as follows 907.1.3 “Document Access”. This code change will eliminate any conflicts and confusion by the referenced standard (NFPA 72) and IFC. This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The proposal was further modified by the Committee. The modification was approved because of the uncertainty and concern over the document storage and maintenance procedures. **Cost Impact**: Will not increase the cost of construction. There are **no cost increases** as this is what is already required in NFPA 72.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: **YES (Select Criteria)** ☐ **NO:** ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F194-16	IBC [F] 907.2.1	Modifies text of Section 907.2.1 “Group A”. This change would serve to increase the fire alarm requirement where the A occupancy is located on a level other than that of exit discharge to be at least as strenuous as that of a B occupancy, which has the same 100 occupant load criteria for such. **Cost Impact**: **Will increase the cost of construction**. This will increase the cost of construction where A occupancies meet the criteria established by the change.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F196-16	IBC [F] 907.2.10 ,IBC [F] 907.2.10.1, IBC [F] 907.2.10.2, IBC [F] 420.6 IEBC 804.4.1.7	Deletes Section 907.2.10 “Group R-4”, Section 907.2.10.1 “Manual fire alarm system”, 1103.7.7 “Group R-4”, Section 904.4.1.7 “Group R-4”. Modifies Section [F] 420.6 “Fire alarm systems and smoke alarms”. Deletes 804.4.17 of the IEBC. Approved as Modified by Public Comment. Per the Committee, this proposal was disapproved based on a request for CTC to further review the proposal. Per reasoning the intent remains was to allow for group homes with residents capable of self preservation to have an appropriate level of safety. To ask for a manual fire alarm system and an automatic smoke detection system for a facility with 16 or fewer residents is not warranted. **Cost Impact**: Will not increase the cost of construction. This is **a logical reduction** in requirements.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
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		☐ Overlapping provisions	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F197-16	IBC [F] 907.2.13.3 (New)	Adds Section 907.2.13.3 “Multi-channel voice evacuation”. A fire alarm system that has multiple channels allows one area of the building to receive an evacuation message, while other areas of the building can be given other instructions. Approved as modified by public comment. During the testimony on F197-16, the committee stated that they felt a single channel system is sufficient and that a multi-channel system is an unwarranted cost increase. The proposed modification would make the requirement for multi-channel voice evacuation systems applicable to high-rise buildings only when the buildings have an occupied floor more than 120 feet above the lowest level of fire department vehicle access. **Cost Impact**: **Will increase the cost of construction**. For those fire alarm notification systems that previously would have been allowed to be installed in high-rise buildings as a single channel system, this code proposal will increase the cost of the fire alarm notification system.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
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		☐ Overlapping provisions	☐	☐

F203-16	IBC [F] 907.3.2)	Modifies text of Section 907.3.2 “Special locking systems”. Revising this section for correlation to "special locking systems" of Sections 1010.1.9.6 (Controlled egress doors in Groups I-1 and I-2), 1010.1.9.7 (Delayed egress), or 1010.1.9.8 (Sensor release of electrically locked egress doors) as each of these three sections for special locking systems require subsequent action by their locking system upon actuation of the automatic sprinkler system or automatic fire detection system. Also, deleting "smoke or heat" in this sentence as the specifics of the detection system does not need to be specified in this sentence. Approved as modified to remove reference to 1010.1.9.8.	Same as change between 2015 IBC and 2018 IBC	

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		Cost Impact: Will not increase the cost of construction. The revisions are **correlative**. No technical revisions intended.		

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		☐ **Overlapping provisions**	☐	☐

F204-16	IBC [F] 907.4.2.1	Modifies text of Section 907.4.2.1 “Location”. This is a correction in terminology. While fire alarm boxes may be located along the egress path, in the route measured as the exit access travel distance, the distance to the manual fire alarm boxes is not the "exit access travel distance". **Cost Impact**: Will not increase the cost of construction. This is only **a clarification** issue and will not affect the cost of construction.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

F206-16	IBC [F] 907.5.2.2.4)	Modifies text of Section 907.5.2.2.4 “Emergency voice/alarm communication captions”. This modification is proposing to add existing language from IBC Section 1108.2.7.3 to this section. This proposal correlates the access provisions with Chapter 9 by adding the scoping language. This proposal further affords the fire official, building official and other users of the code to design and enforce in accordance with Chapter 9 where both fire alarm and emergency voice alarm communication systems provisions are found. **Cost Impact**: Will not increase the cost of construction. This is **a correlation** of codes for better user design and enforcement.	Same as change between 2015 IBC and 2018 IBC	

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TAC Action **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**		**Commission Action** **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ **No Action Needed** ☐ **Overlapping provisions**	**TAC** / **Cmsn.**
F212-16	IBC [F] 907.5.2.3.2	Modifies text of Section 907.5.2.3.2 "907.5.2.3.2 Groups I-1 and R-1". This proposal is an attempt to clarify specifically where the visible notification appliances shall be located in newly constructed Group R-1 and I-1 dwelling and sleeping units and make sure that visible alarm notification is provided such that timely notification to guests with hearing impairments will occur. This requirement will only affect those rooms identified as accessible. **Cost Impact**: **Will increase the cost of construction**. This provision has the potential to add an additional notification appliance however the intent was full visibility within the unit.	Same as change between 2015 IBC and 2018 IBC	
TAC Action **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**		**Commission Action** **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	☐ **No Action Needed** ☐ **Overlapping provisions**	**TAC** / **Cmsn.**
F213-16	IBC [F] 907.5.2.3.3)	Modifies text of Section 907.5.2.3.3 "Group R-2". This proposed change will save construction costs and provide clear direction for designers, owners and installers in R-2 buildings. The code intent has not changed. There needs to be a capability to support visible fire alarm notification appliances in R-2 buildings when needed as the building evolves. Approved as modified by public comment. Changes the text to use the IBC defined term "story" rather than "floor." 2. Correlates with the change to A117.1-2015, which renumbered Chapter 10 to Chapter 11. 3. More specifically recognizes wireless equipment as the new technology	Same as change between 2015 IBC and 2018 IBC	

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		mentioned in the committee reason statement for Approval as Modified. 4. Reformats the three existing options for providing future expansion capability as a list for clarity. Final Action Results F213-16 **Cost Impact**: Will not increase the cost of construction. None. It will have an impact on **saving construction costs** as described above.		

TAC Action	Commission Action		TAC	Cmsn.
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		☐ Overlapping provisions	☐	☐

F216-16	IBC [F] 909.1, IMC [F] 513.1	Modifies text of Section 909.1 “Scope and purpose”. This code change provides correlation with the revision in IFC/IBC 910 where the terminology was revised in the 2015 edition. This proposal complements FS74-15 approved in 2015 which reviewed all Group A I-Code references that "point" to IBC Section 716 and / or to subsection(s) of IBC 716, and revised several of the pointers. With proposal FS101-15 approved last year which completely reorganized IBC Section 716, the pointers in Group B code sections need to be reviewed and several revised **Cost Impact**: Will not increase the cost of construction. The revision is purely **editorial** and has no effect on the cost of construction. It will merely be consistent with the current language in Section 910.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
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Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F217-16, Part I	IBC [F] 909.5.3, [F] 909.5.3.1	Modifies text of Section 909.5.3 “Opening protection”, 909.5.3.1 “Group I-1 Condition 2, Group I-2 and ambulatory care facilities”, 1103.3.2 “Elevator emergency operation”. This proposal complements FS74-15 approved in 2015 which reviewed all Group A I-Code references that "point" to IBC Section 716 and / or to subsection(s) of IBC 716, and revised several of the pointers. **Cost Impact**: Will not increase the cost of construction. There should be **no cost increase**. The proposed revisions should be consistent with the intent of the code.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**	**Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F217-16, Part II	IECC C402.5.4	Modifies text of Section C402.5.4 “Doors and access openings to shafts, chutes, stairways and elevator lobbies”. This proposal complements FS74-15 approved in 2015 which reviewed all Group A I-Code references that "point" to IBC Section 716 and / or to subsection(s) of IBC 716, and revised several of the pointers. With proposal FS101-15 approved last year which completely reorganized IBC Section 716, the pointers in Group B code sections need to be reviewed and several revised. **Cost Impact**: Will not increase the cost of construction. There should be **no cost increase**. The proposed revisions should be consistent with the intent of the code.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

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Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F218-16	IBC [F] 909.6.1	Modifies text of Section 909.6.1 "Minimum pressure difference". This change is intended to address the fact that smoke barriers can exist within a single smoke zone, which may be comprised of active and passive sub-zones. **Cost Impact**: Will not increase the cost of construction. The code change proposal will not increase the cost of construction. This is a **clarification** of the requirements of the current code.	Same as change between 2015 IBC and 2018 IBC	

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Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F221-16	IBC [F] 912.2, IBC [F] 912.2.1	Modifies text of Section 912.2 "Location". Deletes section 912.2.1 "Visible location". This proposal is simply meant as a clarification and enhancement of the existing requirement. Approved by public comment, The previous code proposal attempted to consolidate two sections into one, and to update wording for a technical reason and for clarity. From the committee responses it was clear that the changes made the code section less clear. This public comment goes back to the current code language, and keeps the two sections separate. **Cost Impact**: **Will increase the cost of construction**. May increase the cost of construction due to clarification of the requirement to provide an unobstructed pathway between fire apparatus and a fire department connection. Although this was implicit in the prior code text, the clarifications provided by this	Same as change between 2015 IBC and 2018 IBC	

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		change eliminate the chance for subjective interpretation of the provisions.		

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F224-16	IBC [F] 915.1.3, [F] 915.1.4, [F] 915.1.5, [F] 915.2.3, [F] 915.3, [F] 915.4.3 (New), [F] 915.4.3	Modifies text of Section 915.1.3 “Fuel burning forced-air furnaces”, 915.1.4 “Fuel-burning appliances outside of dwelling units, sleeping units and classrooms”, 915.1.5 “Private garages”, 915.2.3 “Group E occupancies”, 915.3 “Carbon monoxide detection”, 915.4.4 “Combination alarms”. Adds new section 915.4.3 “Locations”. This proposal clarifies the locations where carbon monoxide alarms can be used in accordance with their listings, which is in dwelling units and sleeping rooms. It also clarifies the applications where carbon monoxide detectors must be used, which includes locations other than dwelling units and sleeping units, and in locations where detection is required in a location that may be remote from occupied areas being protected. **Cost Impact**: Will not increase the cost of construction. This proposal merely **clarifies** the applications that require a carbon monoxide detector be provided, as part of a carbon monoxide detection system. This **provides correlation** with the applications for which carbon monoxide detection equipment is listed.	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section as per Florida Statutes	Overlapping provision to be considered during step 2 of the code change process

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Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F226-16	IBC [F] 916	Adds new Section 916.1 “Gas detection system activation”. This proposal is a companion change to the FCAC proposal that adds a new Section 916 on gas detection systems. It adds a baseline detection threshold of 1/2 IDLH for non-flammable gases that require gas detection under other code sections, should a detection threshold not otherwise be specified by such sections. Approved by public comment, modifies text of Section 916.8 to “System activation”. The proposed modifications are for correlation with the section numbering and terminology used in Code Change F75-16, which was recommended for Approval as Submitted by the IFC Code Development Committee. This code change will modify Section 916.8 in F75-16 to specify that the alarm activation threshold for a non-flammable gas will be 1/2 of the IDLH value unless the section of the code requiring gas detection specifies a different value, which is typically the case. **Cost Impact**: Will not increase the cost of construction. This proposal **does not add additional** construction requirements.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F228-16	IBC [F] 202, [F] 916 (New), [F] 916.1 (New), [F] 916.2 (New), [F] 916.3 (New), [F] 916.3.1 (New), [F] 916.4 (New), [F] 916.5 (New)	Adds new definitions “EMERGENCY COMMUNICATION SYSTEM”, “EMERGENCY RESPONSE PLAN”. Adds new Section 105.7.5 Emergency communication system, Section 916 “Emergency Communication Systems”. This code change proposal provides a requirement that a Risk Analysis and an Emergency Response Plan be created for every new educational occupancy and every new A, B occupancy for colleges and universities and new R-2 -occupancies operated by a college or university for student or staff housing. If the completed Risk Analysis indicates that an Emergency Communication System is warranted for the occupancy, this proposal then provides a process for obtaining a permit from	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		the fire code official and refers to NFPA 72 for system installation and maintenance. When a mass disaster event occurs, and they are occurring, the need for real time information communicated in a clear and concise method via various paths is very critical to Life Safety. Approved as modified by public comment, Adds new Section 916 “Mass Notification Systems”. This action will NOT require a mass notification system to be installed; it requires the Risk Analysis which is outlined in detail within NFPA 72. That analysis prepared by a registered design professional along with stakeholders of the college and AHJ that will outline what is needed for this location and application. This code change proposal provides a requirement that a Risk Analysis be created for every new building of size that requires a fire alarm system in college's campuses. This trigger was included so that not any new building would be affected, just those that have already been shown to need a level a life safety. NFPA 72 National Fire Alarm and Signaling Code has a chapter dedicated to Emergency Communication Systems-Mass Notification. The information/requirements for Risk Analysis and qualifications for those performing these services are within NFPA 72; they are matured and are in the 3rd cycle of revisions. **Cost Impact**: **Will increase the cost of construction**. The cost for conducting a Risk Analysis would range from $5,000 to $15,000 per building depending on complexity.		

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Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F238-16	IBC [F] Table 903.2.11.6	Modifies text of TABLE 903.2.11.6 "ADDITIONAL REQUIRED FIRE SUPPRESSION SYSTEMS". This requirement implements the Recommendation #1 included in the NIST Report of the Technical Investigation of The Station Nightclub Fire (NIST NCSTAR 2: Vol. I). Recommendation 1 of the NIST report states: "Model codes should require sprinkler systems for all new and existing nightclubs regardless of size. Group A-2 occupancies involve conditions such as large occupant loads, high occupant density, significant fuel loading and moveable furnishings and decorations. Group A-2 occupancies also include the potential for reduced lighting levels, high noise levels, combustible decorations, strobe and flashing lights, alcohol consumption, and confusing egress paths. Each of these alone can be a significant issue, but when combined they lead to the inability of the occupants to promptly and safely exit the building under fire conditions. This proposal does not reach as far as the recommendation from NIST. While the NIST proposal recommends fire sprinklers in ALL facilities, the proposed section requires the Group A-2 occupancy fire area where alcoholic drinks are consumed in excess of 300 occupants be provided with a fire sprinkler system. The section does not require the other fire areas that may be in the A-2 to be protected, nor does it require the entire floor to be protected. Setting the threshold at 300 occupants will place the requirement where the higher potential for loss of life exists. **Cost Impact**: **Will increase the cost of construction**. Adding a fire sprinkler system in an existing A-2 occupancy that serves alcohol will change the business plan of the owner. Investing into a fire sprinkler system in the long term will benefit the owner by protecting the investment, property, and life safety of the patrons, as well as reduce the liability to the owner and insurance premiums.	Same as change between 2015 IBC and 2018 IBC	

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		☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F258-16	IBC 426.1	Modifies text of Section [F] 426.1 "Combustible dusts, grain processing and storage". The proposal was approved as a reference to the new NFPA standard 652 is necessary. This reference will provide more information on determining dust hazards and coordination with NFPA is important. Approved as modified by public comment. Modifies Section 2203.2 "Dust hazard analysis (DHA), 2204.1 "Specific hazards standards". The purpose of the public comment is to clarify application of the new requirements. **Cost Impact**: Will not increase the cost of construction. For facilities already in compliance with current standards of care there should be **no increase in cost**.	Same as change between 2015 IBC and 2018 IBC	

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		☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F274-16	IMC [F]502.16, [F]502.16.1 (New), [F]502.16.2 (New), [F]502.16.1, [F]502.16.2, Chapter 15; IMC [FG] 304.5.1, [FG] 304.5.1.1, IMC [FG]	Modifies text of section [F] 502.16 "Repair garages for vehicles fueled by lighter-than-air fuels", [F] 502.16.2.1 "Design", [F] 502.16.2.2 "Operation", 703.1 "Hydrogen-generating and refueling operations". *Adds new Section [F] 502.16.1 "Repair garages used for the repair of hydrogen-fueled vehicles",* [F] 502.16.2 "Exhaust ventilation system". Adds new reference standard NFPA 2-2016 "Hydrogen Technologies Code". Deletes entirety of Section 703.1.1 "Natural ventilation", 703.1.2 "Mechanical ventilation", 703.1.3 "Specially engineered installations". The exception language in 2311.7.2 (new numbering) was modified to match existing verbiage found in	Same as change between 2015 IBC and 2018 IBC	

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	304.5.1.2, IMC [FG] 304.5.2, IMC [FG] 304.5.3	the IMC. This proposal is a comprehensive fix of the exhaust ventilation requirements for repair garages for hydrogen fueled vehicles and for exhaust ventilation requirements for the installation hydrogen-generating and refueling operations. The primary goal was consistency and correlation between the requirements found within the IFC, the IMC and the IFGC along with tighter correlation with the requirements of NFPA 2. **Cost Impact**: Will not increase the cost of construction. This proposal **will reduce the cost** of installation by eliminating an internal conflict within the IMC, by **correlating** all of the ICC codes dealing with this topic, and by providing for tighter correlation with NFPA 2 which the I-Codes already refer to for these types of installations.		

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F283-16	IBC 416, [F] 416.1, 416.2.1 (New), [F] 416.2.1, [F] 416.2.2, [F] 416.3.1, [F] 416.5	Modifies text of Section 416 “SPRAY APPLICATION OF FLAMMABLE FINISHES”, [F] 416.1 “General”, [F] 416.2.1 “Surfaces”, [F] 416.2.2 “Ventilation”, [F] 416.3.1 “Surfaces”, [F] 416.5 “Fire protection”. Adds definition of 416.2.1 “Construction”. Modifies definition “SPRAY ROOM”. This proposed code change is intended to correlate the requirements for spray operations in the IBC and the IFC. First, the definition of spray room is revised. The definition of a term is never a good location for code requirements. This proposal removes the 1-hour separation construction requirement from the definition of spray room and places the requirement into Section 2404.2 where it belongs. This revision also correlates with IBC Section 416.2 which requires the 1-hour separation.	Same as change between 2015 IBC and 2018 IBC	

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		Cost Impact: Will not increase the cost of construction. This proposal **correlates** the spray finishing requirements in the IFC and the IBC.		

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		☐ Overlapping provisions	☐	☐

F293-16	IBC [F] 415.11.1.1.1, IFC 2704.2.2.1	Modifies text of Table [F] 415.11.1.1.1 "QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5". The Semiconductor Industry Association is proposing a change in the allowable aggregate quantity of specified gases from a cubic feet limit of 9000 cubic feet to also allow a density limit of 0.2 ft3 per ft2. This density is equivalent to a 45,000 ft2 fabrication area with the current 9000 ft3 limit. Significant increases in building size has occurred with the introduction of the 300 millimeter wafer. Applying the 9000 ft3 aggregate gas limit to this size fabrication area would allow a density of 0.35 cu/ft2 which has been demonstrated to be a safe limit for the industry". Modified by committee, the modification addresses the fact that the original intent of the proposal was to address the greater of the two amounts. **Cost Impact**: Will not increase the cost of construction. It **may reduce the cost** because the manufacturing gases can continue to be placed near the tools where they are used instead of causing them to be piped in from remote locations.	Same as change between 2015 IBC and 2018 IBC	

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Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

F298-16	3103.1 906.1, IBC: 202, 202 (New)	Modifies text of definition [BG] “TENT”, “TENT”, revises 3103.1 “General”. Adds new definition UMBRELLA STRUCTURE. Including the term "umbrella structure" in and as part of definitions, would allow Code Officials clear language to enforce tent regulations when umbrellas reach an individual or collective size to form a structure equivalent to a tent. See photo examples attached. Approved as modified, the modification simply incorporates the concept of an umbrella structure within the definition for tent as it was felt to be a more simplistic and straightforward approach than placing the term throughout the code. **Cost Impact**: Will not increase the cost of construction. Adding **clarification** and new definition to ensure these installations are captured by current code.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F329-16	IBC 3314 (New), [F] 3314.1	Adds new Section IBC [F] 3314.1 “Fire watch during combustible construction”. Ads new Section S3314 “Fire Watch During Construction”. The proposal allows either the Fire Code Official or Building Official to trigger compliance would create a potential conflict since one may trigger the requirement and the other may not. The proposed language is more appropriate for the International fire Code. **Cost Impact**: Will not increase the cost of construction. Most insurers providing coverage during construction require fire watch.	Same as change between 2015 IBC and 2018 IBC	

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		☐ Overlapping provisions	☐	☐

F335-16	IBC [F] 3310.2, IEBC [F] 1505.2	Modifies text of Section 3311.2 “Maintenance”. Adds text “ and accessible means of egress”. Buildings that have been constructed after accessible means of egress was required for new construction need to maintain that accessible means of egress in the same way the general means of egress must be maintained both during construction and during occupancy. Approved as modified by the committee, adding “required” to “accessible means of egress”. **Cost Impact**: Will not increase the cost of construction. The proposal is a **clarification and coordination** of current requirements; therefore, there is no impact on the cost.	Same as change between 2015 IBC and 2018 IBC	

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Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F340-16	IBC [F] 2702.2.17(New), IBC [F] 307.1.1, [F] 414.2, [F] 427 (New), Table [F] 903.2.11.6	Revises Section 307.1.1, Uses other than Group H, Section 414.2, Control areas. Adds new section IBC [F] 2702.2.12 “Laboratory suites”. Adds new SECTION 427 “HIGHER EDUCATION LABORATORIES”, revises TABLE [F] 903.2.11.6 “ADDITIONAL REQUIRED SUPPRESSION SYSTEMS”, [F] TABLE [F]427.3 “DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR”. Adds new definitions “CHEMICAL FUME HOOD”, “GLOVE BOX”, “HIGHER EDUCATION LABORATORY”, “LABORATORY SUITE”, “SPECIAL EXPERT”, “HIGHER EDUCATION LABORATORY”. Adds new standard NFPA 45 - 2015 “Standard On Fire Protection For Laboratories Using Chemicals”, UL 1805 - 2002 “Standard for	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		Laboratory Hoods and Cabinets". **Cost Impact**: **Will increase the cost of construction**. The code change proposal will increase the cost of construction for those entities choosing to voluntarily comply with the requirements of this chapter.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F345-16	IBC [F] Table 307.1(1), [F] Table 414.2.5	Modifies text of TABLE 5003.1.1 (IBC [F]TABLE 307.1(1)) (1) "MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD", TABLE 5003.11.1 (IBC [F] 414.2.5) "MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS", 6303.1.1.2 "Class 3 liquid and solid oxidizers". Many 50 lb. containers of oxidizers have changed to 25 kg or 55 lb. containers. Four containers in use, which is a common condition, would equal 220 lb. This change will continue to allow 4 containers without a noticeable increase in the hazard. The hazard is not noticeably increased and the original concept of retail MAQ quantity, of one pallet load, is maintained. **Furthermore the change brings the IFC in line other NFPA codes that regulate oxidizers.** **Cost Impact**: Will not increase the cost of construction. The code change **will reduce the costs** of distribution by allowing full, instead of partial, pellet loads.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F346-16	IBC [F] Table 307.1(1)	Modifies text of Section TABLE 5003.1.1 IBC [F] 307.1(1)) (1) "MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD". The deletion of the reference to footnote "d" from the Explosives, Division 1.4G line is a cleanup following the successful action of F289-13. Without this deletion the effects of F289-13 will be negated since consumer fireworks are classified as 1.4G explosives and the continuance of footnote "d" would allow the100% increase when sprinklers are present. **Cost Impact**: Will not increase the cost of construction. This **will not increase** the cost of construction it simply reduces the amount of 1.4G explosives permitted in a building equipped throughout with an automatic sprinkler system. This is consistent with the deletion of the same footnote for consumer fireworks that was removed for the 2015 IFC and IBC.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F347-16	IBC [F] Table 307.1(1)	Modifies text of "Explosive", Division 1.5., Definition "Fireworks 1.4G", TABLE "5003.1.1", IBC[F]307.1(1) "MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD", 5601.1.3 "Fireworks", TABLE 5601.8.1 (3) "APPLICATION OF SEPARATION DISTANCE (Q-D) TABLES—DIVISION 1.4 EXPLOSIVES", TABLE 5604.3 "STORAGE AMOUNTS AND MAGAZINE REQUIREMENTS	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		FOR EXPLOSIVES, EXPLOSIVE MATERIALS AND FIREWORKS, 1.3G MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA", TABLE 5604.5.2 (3) "TABLE OF DISTANCES (Q-D) FOR BUILDINGS AND MAGAZINES CONTAINING EXPLOSIVES—DIVISION 1.4", SECTION 5609 "TEMPORARY STORAGE OF FIREWORKS 1.4G (CONSUMER FIREWORKS)". Reverse action of Code Change B3-97 and F18-98 that were based on absent or defective reasoning. Reverse subsequent action of Code Change F265-07/08, F266-07/08 and F267-07/08 based on the defective decision of Code B3-97 and F18-98. this coordinated set of changes is to reverse changes made that were based on absent or defective reasoning. **Cost Impact**: Will not increase the cost of construction. This now **simply clarifies** that Class 1.4G fireworks are considered as explosives and should be addressed this way. A separate line item will no longer be included but it will still be considered as Group H-3 if the MAQ is exceeded.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	**Accommodate Florida Specific Need:** **YES (Select Criteria)** ☐ **NO:** ☐ **a.** ☐ **b.** ☐ **c.** ☐ **d.** ☐ **e.** ☐ **f.** ☐ **Others (Explain):**	☐ **No Action Needed**	☐	☐
		☐ **Overlapping provisions**	☐	☐

F352-16	IBC Table [F] 415.6.2	Modifies text of TABLE 5003.8.2 "DETACHED BUILDING REQUIRED", TABLE [F] 415.6.2 "DETACHED BUILDING REQUIRED". There is a disconnect between the IFC and IBC with regard to the footnotes in these two tables. The tables are identical, however the footnotes are not The revision in Footnote c is simply an editorial revision to provide consistency between the two codes. **Cost Impact**: Will not increase the cost of construction. This proposal **provides correlation** between the IBC and IFC.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F354-16	IBC [F] Table 414.2.2	Modifies text of Section TABLE 5003.8.3.2 ([F] 414.2.2) DESIGN AND NUMBER OF CONTROL AREAS **Cost Impact**: Will not increase the cost of construction. This is an **editorial code change**. Should not result in an increase in the cost of construction since many code users interpret the codes as the proposed revisions state.	Same as change between 2015 IBC and 2018 IBC	

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

F355-16	IBC [F] 414.2.4	Modifies text of Section 5003.8.3.4 (IBC [F]414.2.4) "Fire-resistance-rating requirements". The interior construction of Types IIIA and VA construction, can be built of the exact same material as type IV construction so long that it is calculated or tested to be one hour fire resistance rated. Since Type IIIA and Type VA can be built out of exactly the same material as long as it is one hour, and since the control area is separated from the balance of the building by one hour construction, there is no reason to exclude type IV from this exception from two hour fire resistance rating of the floor assembly and supporting construction for the control area in buildings three stories or less and fully sprinklered with a NFPA 13 sprinkler system. **Cost Impact**: Will not increase the cost of construction. This code proposal **provides more options** to the existing exception and will not increase cost.	Same as change between 2015 IBC and 2018 IBC	

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

TAC Action **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**		**Commission Action** **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ No Action Needed ☐ Overlapping provisions	**TAC** ☐ ☐ **Cmsn.** ☐ ☐
F356-16	[F] 414.2.5 (New), [F] 414.2.5, [F]414.2.5.2 (New), [F] 414.2.5.3 (New)	Adds new Section [F] 414.2.5 “Hazardous material in Group M display and storage areas in Group S storage”, [F]414.2.5.2 “Hazardous material in Group M wholesale and retail sales uses”, [F] 414.2.5.3 “Aerosols”. Modifies text of Section 5003.8.3.5.1 “Non flammable solids and non flammable and noncombustible liquids”, [F] 414.2.5.1 “Non flammable solid and non flammable and non combustible liquids”. The intent of this proposal is to break up this one section into three to address each subject to differentiate between the uses. Additionally to keep the codes consistent the similar section in IFC 5003 is also being addressed. **Cost Impact**: Will not increase the cost of construction. This proposal **will not increase** the cost of construction.	Same as change between 2015 IBC and 2018 IBC	
TAC Action **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ **Others (Explain):**		**Commission Action** **Accommodate Florida Specific Need:** YES (Select Criteria) ☐ NO: ☐ a. ☐ b. ☐ c. ☐ d. ☐ e. ☐ f. ☐ **Others (Explain):**	☐ No Action Needed ☐ Overlapping provisions	**TAC** ☐ ☐ **Cmsn.** ☐ ☐
F363-16	IBC [F] 907.2.16), IBC [F] 307.1.1, [F] 307.2 , [F] 414.1.2.1	Modifies new definitions “AEROSOL CONTAINER”, “AEROSOL PRODUCT”, “AEROSOL PRODUCT WAREHOUSE”. Modifies text of Section 5102.1 “Definitions”, 5104.1.1 “Plastic Aerosol 1 Products”, 5104.3 “Storage in general purpose warehouses”, 5104.3.1 “Nonsegregated storage”, 5104.3.2 “Segregated storage”, 5106.2.2 “Display of aerosol products”, 5106.3 “Aerosol product display and normal merchandising exceeding 8 feet (2438 mm) high” , 5106.3.2 “Automatic sprinkler protection”, 5106.3.3 “Separation of Level	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		2 and 3 aerosol product areas", TABLE 5106.4 "MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND 3 AEROSOLS PRODUCTS", 5106.5 "Special protection design for Level 2 and 3 aerosol products adjacent to flammable and combustible liquids in double-row racks", 5106.5.1 "Fire protection", 5106.5.2 "Cartoned aerosol products", 5106.5.6 "Horizontal barriers", 5106.5.7 "Class I, II, III, IV and plastic commodities", 907.2.16 "Aerosol storage uses", [F] 307.1.1 "Uses other than Group H", [F] 307.2 "Definitions" , 311.2 "Moderate-hazard storage, Group S-1" , [F] 414.1.2.1 "Aerosol Products". This proposal brings the IFC/IBC terminology in line with the referenced standard, NFPA 30B Code for the Manufacture and Storage of Aerosol Products, 2015 Edition Also a code references that were in error are updated. **Cost Impact**: Will not increase the cost of construction. There is **no impact on the cost** of construction as the proposal only **updates** terminology and references.		

TAC Action	Commission Action		TAC	Cmsn.
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		☐ Overlapping provisions	☐	☐

F372-16	IBC [F] 908.8)	Adds new Section 105.6.5 "Carbon dioxide enrichment systems", 908.8 "Carbon dioxide enrichment systems", 5308.3 "Carbon dioxide enrichment systems", 5308.3.1 "Permits", 5308.3.2 "Documentation", 5308.3.3 "Equipment" , 5308.3.4 "Gas detection system", 5308.3.4.1 "System Activation", 5308.3.5 "Pressurization and ventilation", 5308.3.6 "Signage". Modifies text of TABLE 105.6.9 "PERMIT AMOUNTS FOR COMPRESSED GASES". Add new definition "CARBON DIOXIDE ENRICHMENT SYSTEM", "CAUTION". The number of indoor marijuana cultivation facilities is expanding rapidly across the country, and an increasing number of	This change is not similar to that of the FBC. The FBC provides for Florida specific changes to this section	Overlapping provision to be considered during step 2 of the code change process

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

		them are using carbon dioxide enrichment systems to stimulate plant growth. This is creating a potential asphyxiation hazard that is not currently regulated in codes or standards. The hazard is the same whether the systems use liquid insulated CO2 system or CO2 gas containers. The proposal is based in part on Clark County, NV guidelines, and requirements proposed for protecting insulated liquid CO2 systems Approved by public comment. Deletes Section 105.6.5 "Carbon dioxide enrichment systems", 908.8 "Carbon dioxide enrichment systems", 5308.3.1 "Permits", Adds new Section 5307.1 "General", 5307.2 "Ventilation". Modifies text of Section 5307.4 "Carbon dioxide enrichment systems", 5307.4.1 "Documentation", 5307.4.2 "Equipment", 5307.4.3 "Gas detection system", 5307.4.3.1 "System Activation", 5307.4.4 "Pressurization and ventilation", 5307.4.5 "Signage", 5307.4.6 "Seismic and structural design", 5307.4.7 "Container refilling". , TABLE 105.6.9 "PERMIT AMOUNTS FOR COMPRESSED GASES". Revisions are primarily to correlate the formatting and numbering of F372-16 with F369-16. Additional revisions to the original proposal have been made for clarity and for consistency of text for provisions that are similar to those added carbon dioxide beverage dispensing systems under F369-16 **Cost Impact**: **Will increase the cost of construction**. This proposal will require a gas detection system, ventilation system and the system installation to comply with requirements that are not currently in the code.		

TAC Action	Commission Action		TAC	Cmsn.
Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	Accommodate Florida Specific Need: YES (Select Criteria) ☐ NO: ☐ a.☐ b.☐ c.☐ d.☐ e.☐ f.☐ Others (Explain):	☐ No Action Needed	☐	☐
		☐ Overlapping provisions	☐	☐

Rule 61G20-2.002 2. Technical amendments needed to accommodate the specific needs of this state include but are not limited to amendments to the Florida Building Code that provide for the following: a. Establish minimum life safety construction requirements to protect buildings and their occupants from fire, wind, flood, and storm surge using the latest technical research and engineering standards for buildings and materials products. b. Provide for flood protection provisions that are consistent with the latest flood protection requirements of the National Flood Insurance Program. c. Maintain eligibility for federal funding and discounts from the National Flood Insurance Program, the Federal Emergency Management Agency, and the United States Department of Housing and Urban Development. d. Provide for energy efficiency standards for buildings that meet or exceed the national energy standards as mandated by Title III of the Energy Conservation and Protection Act. e. Maintain coordination with the Florida Fire Prevention Code. f. Provide for the latest industry standards and design

Code Change No: F12-16

Original Proposal

Section(s): 105.6.16, [A] 106.3, 107.5, 202, 309.2, 311.2.1, 315.6, 316.2.1, 403.10.2.2.1, 504.1, 509.2, 603.1.5, 603.1.6.1, 605.12, 606.5, 608.4.1, 703.1, 903.2.11.1.1 (IBC [F] 903.2.11.1.1), 903.2.11.2 (IBC [F] 903.2.11.2), 904.12.4 (IBC [F] 904.12.4), 905.5 (IBC [F] 905.5), 906..5 (IBC [F] 906.5), 907.2 (IBC [F] 907.2), 907.2.6 (IBC [F] 907.2.6), 907.2.6.3.3 (IBC [F] 907.2.6.3.3), 907.2.10.1 (IBC [F] 907.2.10.1), 907.2.20 (IBC [F] 907.2.20), 907.2.22.2 (IBC [F] 907.2.22.2), 907.4.2.6 (IBC [F] 907.4.2.6), 907.8.2 (IBC [F] 907.8.2), 909.12.4 (IBC [F] 909.12.4, IMC [F] 513.12.4), 910.4.5 (IBC [F] 910.4.5), 914.2.3, 1105.9, 2005.4, 2005.7, 2005.7.1, 2006.6.1, 2301.1, 2303.2, 2306.2.5, 2308.6, 2310.6.3, 2404.3.2.5, 2405.3.2, 2404.8.1.2, 2404.7.8.2, 2703.10.1.1, 2703.10.4.4.5, 2903.3, 3201.4, 3206.2, 3206.6.1, 3206.9.1.1, 3309.1, 3313.1 (IBC [F] 3311.1, IEBC [F] 1506.1), 3503.6, 3504.2.6, 5003.2.2.1, 5004.2.3, 5303.5.3, 5305.4, 5503.4.3, 5606.5.2.1, 5606.5.2.3, 5703.6.2.1, 5703.6.6.1, 5704.2.9.6.2, 5704.2.9.7.5.1, 5704.3.5.4, 5704.3.6.2, 5706.4.7.6, 5706.4.10.4, 5706.5.3.1.1, 5706.5.4.5, 6004.2.2.10.3, 6109.9, 6109.10, 6109.15, D102.1, I101.3, L104.6, L104.14.1; IWUIC [A] 109.1.1, [F] 403.1

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

Revise as follows:

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

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

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

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

Add new definition as follows:

SECTION 202
DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

Exceptions:

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

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

Exceptions:

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

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

Exceptions:

1. A manual fire alarm system is not required in buildings not more than two stories in height where all individual *sleeping units* and contiguous attic and crawl spaces to those units are separated from each other and public or common areas by not less than 1-hour *fire partitions* and each individual *sleeping unit* has an *exit* directly to a *public way*, *egress court* or yard.
2. Manual fire alarm boxes are not required throughout the building where all of the following conditions are met:
   2.1. The building is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1 or 903.3.1.
   2.2. The notification appliances will activate upon sprinkler water flow.
   2.3. Not fewer than one manual fire alarm box is installed at an *approved* location.

2.4. Manual fire alarm boxes in resident or patient sleeping areas shall not be required at *exits* where located at all nurses' control stations or other constantly attended staff locations, provided such stations are visible and continuously ~~accessible~~ available for access and that the distances of travel required in Section 907.4.2.1 are not exceeded.

907.2.20 Covered and open mall buildings. Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall ~~be accessible to~~ have access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

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

1. Airport traffic control cab.
2. Electrical and mechanical equipment rooms.
3. Airport terminal radar and electronics rooms.
4. Office spaces incidental to the tower operation.
5. Lounges for employees, including sanitary facilities.
6. *Means of egress*.
7. ~~Accessible utility shafts.~~
7. Utility shafts with access.

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

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

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

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

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

914.2.3 Emergency voice/alarm communication system. Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. Emergency voice/alarm communication systems serving a mall, required or otherwise, shall ~~be accessible to~~ have access for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

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

Exception: Manual fire alarm boxes in patient sleeping areas shall not be required at *exits* if located at all nurses' control stations or other constantly attended staff locations, provided such stations are

visible and continuously ~~accessible~~ open for access and that travel distances required in Section 907.4.2.1 are not exceeded.

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

2404.7.8.2 Attachment. Overspray collection filters shall be readily removable and ~~accessible~~ have access for cleaning or replacement.

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

Exceptions:

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

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

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

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

TABLE 3206.2
GENERAL FIRE PROTECTION AND LIFE SAFETY REQUIREMENTS

COMMODITY CLASS	SIZE OF HIGH-PILED STORAGE AREA[a] (square feet) (see Sections 3206.2 and 3206.4)	ALL STORAGE AREAS (See Sections 3206, 3207 and 3208)[b]				SOLID-PILED STORAGE, SHELF STORAGE AND PALLETIZED STORAGE (see Section 3207.3)		
		Automatic fire-extinguishing system (see Section 3206.4)	Fire detection system (see Section 3206.5)	Building access (see Section 3206.6)	Smoke and heat removal (see Section 3206.7)	Maximum pile dimension[c] (feet)	Maximum permissible storage height[d] (feet)	Maximum pile volume (cubic feet)
I-IV	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	Not Required	Not Required	Not Required
	501-2,500	Not Required[a]	Yes[i]	Not Required[e]	Not Required	100	40	100,000
	2,501-12,000 Open to the Public ~~accessible~~	Yes	Not Required	Not Required[e]	Not Required	100	40	400,000
	2,501-12,000 Not open to the public ~~Nonpublic accessible~~ (Option 1)	Yes	Not Required	Not Required[e]	Not Required	100	40	400,000
	2,501-12,000 Not open to the public ~~Nonpublic accessible~~ (Option 2)	Not Required[a]	Yes	Yes	Yes[j]	100	30[f]	200,000
	12,001-20,000	Yes	Not Required	Yes	Yes[j]	100	40	400,000
	20,001-500,000	Yes	Not Required	Yes	Yes[j]	100	40	400,000
	Greater than 500,000[g]	Yes	Not Required	Yes	Yes[j]	100	40	400,000
High hazard	0-500	Not Required[a]	Not Required	Not Required[e]	Not Required	50	Not Required	Not Required
	501-2,500 Open to the Public ~~accessible~~	Yes	Not Required	Not Required[e]	Not Required	50	30	75,000
	501-2,500 Not open to the public ~~Nonpublic accessible~~ (Option 1)	Yes	Not Required	Not Required[e]	Not Required	50	30	75,000
	501-2,500 Not open to the public ~~Nonpublic accessible~~ (Option 2)	Not Required[a]	Yes	Yes	Yes[j]	50	20	50,000
	2,501-300,000	Yes	Not Required	Yes	Yes[j]	50	30	75,000
	300,001-500,000[g, h]	Yes	Not Required	Yes	Yes[j]	50	30	75,000

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

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

b. For aisles, see Section 3206.9.

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

d. For storage in excess of the height indicated, special fire protection shall be provided in accordance with Note g where required by the fire code official. See Chapters 51 and 57 for special limitations for aerosols and flammable and combustible liquids, respectively.

e. Section 503 shall apply for fire apparatus access.
f. For storage exceeding 30 feet in height, Option 1 shall be used.
g. Special fire protection provisions including, but not limited to, fire protection of exposed steel columns; increased sprinkler density; additional in-rack sprinklers, without associated reductions in ceiling sprinkler density; or additional fire department hose connections shall be provided required by the fire code official.
h. High-piled storage areas shall not exceed 500,000 square feet. A 2-hour fire wall constructed in accordance with Section 706 the *International Building Code* shall be used to divide high-piled storage exceeding 500,000 square feet in area.
i. Not required where an automatic fire-extinguishing system is designed and installed to protect the high-piled storage area in accordance with Sections 3207 and 3208.
j. Not required where storage areas are protected by either early suppression fast response (ESFR) sprinkler systems or control mode special application sprinklers with a response time index of 50 $(m \cdot s)^{1/2}$ or less that are listed to control a fire in the stored commodities with 12 or fewer sprinklers, installed in accordance with NFPA 13.

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

3206.9.1.1 Sprinklered buildings. Aisles in sprinklered buildings shall be not less than 44 inches (1118 mm) wide. Aisles shall be not less than 96 inches (2438 mm) wide in *high-piled storage areas* exceeding 2,500 square feet (232 m^2) in area, that are accessible to the public and designated to contain high-hazard commodities.

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

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

3309.1 Emergency telephone. ~~Readily accessible emergency~~ Emergency telephone facilities with ready access shall be provided in an *approved* location at the construction site. The street address of the construction site and the emergency telephone number of the fire department shall be posted adjacent to the telephone.

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

3503.6 Signage. Visible hazard identification signs shall be provided where required by Chapter 50. Where the hot work area is ~~accessible~~ open to persons other than the operator of the hot work equipment, conspicuous signs shall be posted to warn others before they enter the hot work area. Such signs shall display the following warning:

CAUTION HOT WORK IN PROGRESS STAY CLEAR

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

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

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

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

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

   Exceptions:

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

5004.2.3 Containment pallets. Where used as an alternative to spill control and secondary containment for outdoor storage in accordance with the exception in Section 5004.2, containment pallets shall comply with all of the following:

1. A liquid-tight sump ~~accessible~~ with access for visual inspection shall be provided.
2. The sump shall be designed to contain not less than 66 gallons (250 L).
3. Exposed surfaces shall be compatible with material stored.
4. Containment pallets shall be protected to prevent collection of rainwater within the sump.

5303.5.3 Securing compressed gas containers, cylinders and tanks. *Compressed gas* containers, cylinders and tanks shall be secured to prevent falling caused by contact, vibration or seismic activity. Securing of *compressed gas* containers, cylinders and tanks shall be by one of the following methods:

1. Securing containers, cylinders and tanks to a fixed object with one or more restraints.

2. Securing containers, cylinders and tanks on a cart or other mobile device designed for the movement of *compressed gas* containers, cylinders or tanks.
3. Nesting of *compressed gas* containers, cylinders and tanks at container filling or servicing facilities or in sellers' warehouses not ~~accessible~~ open to the public. Nesting shall be allowed provided the nested containers, cylinders or tanks, if dislodged, do not obstruct the required *means of egress*.
4. Securing of *compressed gas* containers, cylinders and tanks to or within a rack, framework, cabinet or similar assembly designed for such use.

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

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

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

5606.5.2.1 Smokeless propellant. Commercial stocks of smokeless propellants shall be stored as follows:

1. Quantities exceeding 20 pounds (9 kg), but not exceeding 100 pounds (45 kg) shall be stored in portable wooden boxes having walls of not less than 1 inch (25 mm) nominal thickness.
2. Quantities exceeding 100 pounds (45 kg), but not exceeding 800 pounds (363 kg), shall be stored in nonportable storage cabinets having walls not less than 1 inch (25 mm) nominal thickness. Not more than 400 pounds (182 kg) shall be stored in any one cabinet, and cabinets shall be separated by a distance of not less than 25 feet (7620 mm) or by a *fire partition* having a *fire-resistance rating* of not less than 1 hour.
3. Storage of quantities exceeding 800 pounds (363 kg), but not exceeding 5,000 pounds (2270 kg) in a building shall comply with all of the following:
   3.1. The warehouse or storage room is ~~unaccessible~~ not open to unauthorized personnel.
   3.2. Smokeless propellant shall be stored in nonportable storage cabinets having wood walls not less than 1 inch (25 mm) nominal thickness and having shelves with not more than 3 feet (914 mm) of separation between shelves.
   3.3. Not more than 400 pounds (182 kg) is stored in any one cabinet.
   3.4. Cabinets shall be located against walls of the storage room or warehouse with not less than 40 feet (12 192 mm) between cabinets.
   3.5. The minimum required separation between cabinets shall be 20 feet (6096 mm) provided that *barricades* twice the height of the cabinets are attached to the wall, midway between each cabinet. The *barricades* must extend not less than 10 feet (3048 mm) outward, be firmly attached to the wall and be constructed of steel not less than $^1/_4$ inch thick (6.4 mm), 2-inch (51 mm) nominal thickness wood, brick or concrete block.
   3.6. Smokeless propellant shall be separated from materials classified as *combustible liquids*, flammable liquids, flammable solids or oxidizing materials by a distance of 25 feet (7620 mm) or by a *fire partition* having a *fire-resistance rating* of 1 hour.
   3.7. The building shall be equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.
4. Smokeless propellants not stored in accordance with Item 1, 2, or 3 above shall be stored in a Type 2 or 4 magazine in accordance with Section 5604 and NFPA 495.

5606.5.2.3 Small arms primers. Commercial stocks of small arms primers shall be stored as follows:

1. Quantities not to exceed 750,000 small arms primers stored in a building shall be arranged such that not more than 100,000 small arms primers are stored in any one pile and piles are not less than 15 feet (4572 mm) apart.
2. Quantities exceeding 750,000 small arms primers stored in a building shall comply with all of the following:
   2.1. The warehouse or storage building ~~shall~~is not ~~be accessible~~ open to unauthorized personnel.
   2.2. Small arms primers shall be stored in cabinets. Not more than 200,000 small arms primers shall be stored in any one cabinet.
   2.3. Shelves in cabinets shall have vertical separation of not less than 2 feet (610 mm).
   2.4. Cabinets shall be located against walls of the warehouse or storage room with not less than 40 feet (12 192 mm) between cabinets. The minimum required separation between cabinets shall be allowed to be reduced to 20 feet (6096 mm) provided that *barricades* twice the height of the cabinets are attached to the wall, midway between each cabinet. The *barricades* shall be firmly attached to the wall and shall be constructed of steel not less than $^{1}/_{4}$ inch thick (6.4 mm), 2-inch (51 mm) nominal thickness wood, brick or concrete block.
   2.5. Small arms primers shall be separated from materials classified as *combustible liquids*, flammable liquids, flammable solids or oxidizing materials by a distance of 25 feet (7620 mm) by a *fire partition* having a *fire-resistance rating* of 1 hour.
   2.6. The building shall be protected throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.
3. Small arms primers not stored in accordance with Item 1 or 2 of this section shall be stored in a magazine meeting the requirements of Section 5604 and NFPA 495.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

5706.5.3.1.1 Shutoff valves. *Approved* automatically or manually activated shutoff valves shall be provided where the transfer hose connects to the process piping, and on both sides of any exterior fire-

resistance-rated wall through which the piping passes. Manual shutoff valves shall be arranged so that they ~~are accessible~~ have access from grade. Valves shall not be locked in the open position.

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

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

   Exceptions:

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

7. The tank vehicle shall comply with the requirements of NFPA 385 and local, state and federal requirements. The tank vehicle's specific functions shall include that of supplying fuel to motor vehicle fuel tanks. The vehicle and all its equipment shall be maintained in good repair.
8. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the tank vehicle or the point of fueling shall be prominently posted on three sides of the vehicle including the back and both sides.
9. A portable fire extinguisher with a minimum rating of 40:BC shall be provided on the vehicle with signage clearly indicating its location.
10. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.
11. The dispensing hose shall not be extended from the reel more than 100 feet (30 480 mm) in length.
12. Absorbent materials, nonwater-absorbent pads, a 10-foot-long (3048 mm) containment boom, an *approved* container with lid and a nonmetallic shovel shall be provided to mitigate a minimum 5-gallon (19 L) fuel spill.
13. Tank vehicles shall be equipped with a "fuel limit" switch such as a count-back switch, to limit the amount of a single fueling operation to not more than 500 gallons (1893 L) before resetting the limit switch.

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

14. Persons responsible for dispensing operations shall be trained in the appropriate mitigating actions in the event of a fire, leak or spill. Training records shall be maintained by the dispensing company.
15. Operators of tank vehicles used for mobile fueling operations shall have in their possession at all times an emergency communications device to notify the proper authorities in the event of an emergency.
16. The tank vehicle dispensing equipment shall be constantly attended and operated only by designated personnel who are trained to handle and dispense motor fuels.
17. Fuel dispensing shall be prohibited within 25 feet (7620 mm) of any source of ignition.
18. The engines of vehicles being fueled shall be shut off during dispensing operations.
19. Nighttime fueling operations shall only take place in adequately lighted areas.
20. The tank vehicle shall be positioned with respect to vehicles being fueled to prevent traffic from driving over the delivery hose.
21. During fueling operations, tank vehicle brakes shall be set, chock blocks shall be in place and warning lights shall be in operation.
22. Motor vehicle fuel tanks shall not be topped off.
23. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the tank vehicle.
24. The *fire code official* and other appropriate authorities shall be notified when a reportable spill or unauthorized discharge occurs.
25. Operators shall place a drip pan or an absorbent pillow under each fuel fill opening prior to and during dispensing operations. Drip pans shall be liquid-tight. The pan or absorbent pillow shall have a capacity of not less than 3 gallons (11.36 L). Spills retained in the drip pan or absorbent pillow need not be reported. Operators, when fueling, shall have on their person an absorbent pad capable of capturing diesel fuel overfills. Except during fueling, the nozzle shall face upward and an absorbent pad shall be kept under the nozzle to catch drips. Contaminated absorbent pads or pillows shall be disposed of regularly in accordance with local, state and federal requirements.

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

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

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

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

6109.10 Storage within buildings not ~~accessible~~ open to the public. The maximum quantity allowed in one storage location in buildings not ~~accessible~~ open to the public, such as industrial buildings, shall not exceed a water capacity of 735 pounds (334 kg) [nominal 300 pounds (136 kg) of LP-gas]. Where additional storage locations are required on the same floor within the same building, they shall be separated by not less than 300 feet (91 440 mm). Storage beyond these limitations shall comply with Section 6109.11.

6109.15 LP-gas cylinder exchange for resale. In addition to other applicable requirements of this chapter, facilities operating LP-gas cylinder exchange stations that are ~~accessible~~ open to the public shall comply with the following requirements.

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

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

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

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

6.1. Corroded or leaking batteries or terminals.
6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
6.3. Mechanical damage to heat or smoke detectors.
6.4. Tripped fuses.

7. Fire department connections having any of the following conditions:
   7.1. Fire department connections are not visible or ~~accessible~~ available for access from the fire apparatus access road.
   7.2. Couplings or swivels are damaged
   7.3. Plugs and caps are missing or damaged.
   7.4. Gaskets are deteriorated.
   7.5. Check valve is leaking.
   7.6. Identification signs are missing.
8. Fire pumps having any of the following conditions:
   8.1. Pump room temperature is less than 40°F (4.4°C).
   8.2. Ventilating louvers are not freely operable.
   8.3. Corroded or leaking system piping.
   8.4. Diesel fuel tank is less than two-thirds full.
   8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

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

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

2015 International Wildland-Urban Interface Code

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

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

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

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

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

ALTERNATIVE CONCEPTS

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

Exterior sprinkler systems. Currently, there is no nationally accepted standard for the design and installation of exterior fire sprinkler systems. Interior sprinkler systems are regulated by nationally recognized standards that have specific requirements. However, exterior sprinkler systems lack such

uniformity. What is generally proposed is a type of sprinkler system, placed on the roofs or eaves of a building, whose primary purpose is to wet down the roof. These types of systems can be activated either manually or automatically. However, the contemporary thought on exterior sprinkler systems is that if the roof classification is of sufficient fire resistance, exterior sprinklers are of little or no value.

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

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

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

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

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

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

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

A Fire Protection Plan describes ways to minimize the fire problems created by a specific project or development. The purpose for the Fire Protection Plan is to reduce the burden and impact of the project or development on the community's fire protection delivery system. The plan may utilize components of land use, building construction, vegetation management and other design techniques and technologies. It should include specific mitigation measures consistent with the unique problems resulting from the

location, topography, geology, flammable vegetation and climate of the proposed site. The plan shall be consistent with this code, and *approved* by the fire code official. The cost of preparation and review is to be borne by the project or development proponent.

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

2015 International Mechanical Code

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

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

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

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

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

Cost Impact: Will not increase the cost of construction
This is a change in terminology for clarity and will have not technical changes to the codes.

Report of Committee Action Hearings

Committee Action: **Disapproved**

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

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

703.1 Maintenance. The required *fire-resistance rating* of fire-resistance-rated construction, including, but not limited to, walls, firestops, shaft enclosures, partitions, *smoke barriers*, floors, fire-resistive coatings and sprayed fire-resistant materials applied to

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

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

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

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

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

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

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

Exceptions:

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

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

Exceptions:

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

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

907.2.20 Covered and open mall buildings. Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. ~~Emergency~~ *Access to* emergency voice/alarm communication systems serving a mall, required or otherwise, shall ~~have access~~ be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

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

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

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

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

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

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

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

914.2.3 Emergency voice/alarm communication system. Where the total floor area exceeds 50,000 square feet (4645 m^2) within either a covered mall building or within the perimeter line of an open mall building, an emergency voice/alarm communication system shall be provided. ~~Emergency~~ *Access to* emergency voice/alarm communication systems serving a mall, required or otherwise, shall ~~have access~~ be provided for the fire department. The system shall be provided in accordance with Section 907.5.2.2.

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

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

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

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

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

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

Exceptions:

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

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

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

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

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

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

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

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

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

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

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

   Exceptions:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. Sprinkler and standpipe system piping and fittings having any of the following conditions:
   1.1. Signs of leakage.
   1.2. Evidence of corrosion.
   1.3. Misalignment.
   1.4. Mechanical damage.
2. Sprinkler piping support having any of the following conditions:
   2.1. Materials resting on or hung from sprinkler piping.
   2.2. Damaged or loose hangers or braces.
3. Class II and Class III standpipe systems having any of the following conditions:
   3.1. No hose or nozzle, where required.
   3.2. Hose threads incompatible with fire department hose threads.
   3.3. Hose connection cap missing.
   3.4. Mildew, cuts, abrasions and deterioration evident.
   3.5. Coupling damaged.
   3.6. Gaskets missing or deteriorated.
   3.7. Nozzle missing or obstructed.
4. Hose racks and cabinets having any of the following conditions:
   4.1. Difficult to operate or damaged.
   4.2. Hose improperly racked or rolled.
   4.3. Inability of rack to swing 90 degrees (1.57 rad) out of the cabinet.
   4.4. Cabinet locked, except as permitted by this code.
   4.5. Cabinet door will not fully open.

4.6. Door glazing cracked or broken.

5. Portable fire extinguishers having any of the following conditions:
   5.1. Broken seal or tamper indicator.
   5.2. Expired maintenance tag.
   5.3. Pressure gauge indicator in "red."
   5.4. Signs of leakage or corrosion.
   5.5. Mechanical damage, denting or abrasion of tank.
   5.6. Presence of repairs such as welding, soldering or brazing.
   5.7. Damaged threads.
   5.8. Damaged hose assembly, couplings or swivel joints.
6. Fire alarm and detection control equipment, initiating devices and notification appliances having any of the following conditions:
   6.1. Corroded or leaking batteries or terminals.
   6.2. Smoke detectors having paint or other ornamentation that is not factory-applied.
   6.3. Mechanical damage to heat or smoke detectors.
   6.4. Tripped fuses.
7. Fire department connections having any of the following conditions:
   7.1. Fire department connections are not visible or ~~available for access~~ able to accessed from the fire apparatus access road.
   7.2. Couplings or swivels are damaged
   7.3. Plugs and caps are missing or damaged.
   7.4. Gaskets are deteriorated.
   7.5. Check valve is leaking.
   7.6. Identification signs are missing.
8. Fire pumps having any of the following conditions:
   8.1. Pump room temperature is less than 40°F (4.4°C).
   8.2. Ventilating louvers are not freely operable.
   8.3. Corroded or leaking system piping.
   8.4. Diesel fuel tank is less than two-thirds full.
   8.5. Battery readings, lubrication oil or cooling water levels are abnormal.

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

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

2015 International Wildland-Urban Interface Code

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

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

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

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

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

ALTERNATIVE CONCEPTS

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

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

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

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

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

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

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

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

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

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

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

2015 International Mechanical Code

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

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

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

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

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

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

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

Section #	Code Change Item #	CAH Result
IFC 106.3	ADM82-16	Approved as Modified
IFC 3201.4	F313-16	Approved as Submitted
IFC 3206.6.1	F316-16	Approved as Submitted
IFC 3309.1	F327-16	Approved as Modified
IWUIC 109.1.1	ADM82-16	Approved as Modified

In addition to the definitions above, the following sections were revised in the original proposal and no modifications to these sections are included in this Public Comment. These sections will go forward with the modifications shown in the original proposal.

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

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

Final Action Results

F12-16 **AMPC1**

Code Change No: F14-16

Original Proposal

Section: 311.2.2, 503.6, 508.1.1, 907.5.1 (IBC [F] 907.5.1), 909.15 (IBC [F] 909.15), 912.2 (IBC [F] 912.2), 912.2.1(IBC [F] 912.2.1), 912.4 (IBC [F] 912.4), 912.4.2 (IBC [F] 912.4.2), 3209.4, B103.1, B103.2, D103.2, L104.14.1; IBC [F] 403.4.6, [F] 911.1.1

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

Revise as follows:

311.2.2 Fire protection. Fire alarm, sprinkler and stand-pipe systems shall be maintained in an operable condition at all times.

Exceptions:

1. Where the premises have been cleared of all combustible materials and debris and, in the opinion of the *fire code official*, the type of construction, *fire separation distance* and security of the premises do not create a fire hazard.
2. Where *approved* by the fire ~~chief~~ code official, buildings that will not be heated and where *fire protection systems* will be exposed to freezing temperatures, fire alarm and sprinkler systems are permitted to be placed out of service and standpipes are permitted to be maintained as dry systems (without an automatic water supply), provided the building has no contents or storage, and windows, doors and other openings are secured to prohibit entry by unauthorized persons.

503.6 Security gates. The installation of security gates across a fire apparatus access road shall be *approved* by the fire ~~chief~~ code official. Where security gates are installed, they shall have an *approved* means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be *listed* in accordance with UL 325. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200.

508.1.1 (IBC [F] 911.1.1) Location and access. The location and accessibility of the *fire command center* shall be *approved* by the fire ~~chief~~ code official.

907.5.1 Presignal feature. A presignal feature shall not be installed unless *approved* by the *fire code official* ~~and the fire department~~. Where a presignal feature is provided, a signal shall be annunciated at a constantly attended location *approved* by the ~~fire department~~ *fire code official*, so that occupant notification can be activated in the event of fire or other emergency.

909.15 Control diagrams. Identical control diagrams showing all devices in the system and identifying their location and function shall be maintained current and kept on file with the *fire code official*, the fire department and in the *fire command center* in a format and manner *approved* by the ~~fire chief~~ *fire code official*.

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be *approved* by the ~~fire chief~~ *fire code official*.

912.2.1 Visible location. Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise *approved* by the ~~fire chief~~ *fire code official*.

912.4 Access. Immediate access to fire department connections shall be maintained at all times and without obstruction by fences, bushes, trees, walls or any other fixed or moveable object. Access to fire department connections shall be *approved* by the ~~fire chief~~ *fire code official*.

> **Exception:** Fences, where provided with an access gate equipped with a sign complying with the legend requirements of Section 912.5 and a means of emergency operation. The gate and the means of emergency operation shall be *approved* by the ~~fire chief~~ *fire code official* and maintained operational at all times.

912.4.2 Clear space around connections. A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided and maintained in front of and to the sides of wall-mounted fire department connections and around the circumference of free-standing fire department connections, except as otherwise required or *approved* by the ~~fire chief~~ *fire code official*.

3209.4 Automated rack storage. *High-piled storage areas* with automated rack storage shall be provided with a manually activated emergency shutdown switch for use by emergency personnel. The switch shall be clearly identified and shall be in a location *approved* by the ~~fire chief~~ *fire code official*.

B103.1 Decreases. The ~~fire chief~~ *fire code official* is authorized to reduce the fire-flow requirements for isolated buildings or a group of buildings in rural areas or small communities where the development of full fire-flow requirements is impractical.

B103.2 Increases. The ~~fire chief~~ *fire code official* is authorized to increase the fire-flow requirements where conditions indicate an unusual susceptibility to group fires or conflagrations. An increase shall not be more than twice that required for the building under consideration.

D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.

> **Exception:** Grades steeper than 10 percent as *approved* by the ~~fire chief~~ *fire code official*.

L104.14.1 Location. The location of the external mobile air connection shall be accessible to mobile air apparatus and *approved* by the ~~fire chief~~ *fire code official*.

2015 International Building Code

Revise as follows:

[F] 403.4.6 Fire command. A *fire command center* complying with Section 911 shall be provided in a location *approved* by the ~~fire department~~ *fire code official*.

Reason: This proposal will provide consistency when approval is needed for items utilized during firefighting operations. The IFC and IBC both contain requirements where either the "fire code official", or the "fire chief", or the "fire department" needs to provide approval. Most sections in the IFC and IBC require approval by the fire code official, but for example, IBC Section 403.4.6 refers to the "fire department" for approval of the location of the fire command center.

The definition of "fire code official" states, "The fire chief or other designated authority charged with the administration and enforcement of the code, or a duly authorized representative." Therefore, when approval is required, this proposal is suggesting that the fire code official is the appropriate term.

If the fire code official is not the fire chief, then the fire code official still has the ability to confer with the fire chief to obtain their input. The authority and responsibility will be assigned to the fire code official as it is done throughout the rest of the code.

The change to the title in IBC Section 403.4.6 is merely editorial, but it more appropriately describes the content of the section.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014

and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will not increase the cost of construction
This is only a change in terminology.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was seen as a good editorial clean up of the use of the term "fire code official" versus "fire chief." The IFC should allow the local jurisdictions to determine whether it should specifically call out the fire chief. It was noted also that the definition of "fire code official" includes "fire chief."

Assembly Action: **None**

Final Action Results

F14-16	**AS**

Code Change No: F44-16

Original Proposal

Section(s): 508.1.3, IBC [F] 911.1.3

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

Revise as follows:

508.1.3 (IBC [F] 911.1.3) Size. The *fire command center* shall be not less than ~~200~~ 0.015 percent of the total building area of the facility served or 96 square feet (~~19~~ 8.9 m^2) in area, whichever is greater, with a minimum dimension of ~~10~~ 0.7 times the square root of the room area, or 8 feet (~~3048~~ 2438 mm), whichever is greater.

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

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

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

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

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

Report of Committee Action Hearings

Committee Action: **Disapproved**

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

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

508.1.3 (IBC [F] 911.1.3) Size. The *fire command center* shall be not less than 0.015 percent of the total building area of the facility served or ~~96~~ 200 square feet (19 m^2) in area, whichever is greater, with a minimum dimension of 0.7 times the square root of the room area, or ~~8~~ 10 feet (~~2438~~ 3048 mm), whichever is greater.

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

Final Action Results

F44-16 **AMPC1**

Code Change No: F56-16

Original Proposal

Section: 510.4.2.3, 604.2.3, IBC [F] 2702.2.3

Proponent: Sagiv Weiss-Ishai, SFFD, representing San Francisco Fire Department (sagiv.weiss-ishai@sfgov.org)

Revise as follows:

510.4.2.3 Standby power. Emergency responder radio coverage systems shall be provided with standby power in accordance with Section 604. The standby power supply shall be capable of operating the emergency responder radio coverage system for a duration of not less than ~~24~~ 12 hours at 100 percent system operation capacity.

604.2.3 (IBC [F] 2702.2.3) Emergency responder radio coverage systems. Standby power shall be provided for emergency responder radio coverage systems as required in Section 510.4.2.3. The standby power supply shall be capable of operating the emergency responder radio coverage system for a duration of not less than ~~24~~ 12 hours at 100 percent system operation capacity.

Reason: It is not practical to require that 24 hour standby power be provided for these systems, especially for those located in buildings where stationary engine generators are not available. This proposal correlates the IFC/IBC standby power requirements with those included in NFPA 72, Section 24.5.2.5.5.2.

Cost Impact: Will not increase the cost of construction
It will significantly reduce the cost of the system since the proposed 12-HR UPS power back up system is less costly than the currently required 24-HR UPS system.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal appropriately brings the power supply requirements in line with that which is required for fire alarm systems.

Analysis: Note that proposals F56-16 and F57-16 should be coordinated as they provide slightly different approaches to the same subject.

Assembly Action: **None**

Final Action Results

F56-16	**AS**

Code Change No: F57-16

Original Proposal

Section: 510.4.2.3, 604.2.3; IBC [F] 2702.2.3

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

Revise as follows:

510.4.2.3 Standby power. Emergency responder radio coverage systems shall be provided with dedicated standby batteries or provided with 2 hour standby batteries and connected to the facility generator power system in accordance with Section 604. The standby power supply shall be capable of operating the emergency responder radio coverage system at 100 percent system capacity for a duration of not less than ~~24~~ 12 hours.

604.2.3 (IBC [F] 2702.2.3) Emergency responder radio coverage systems. Standby power shall be provided for emergency responder radio coverage systems as required in Section 510.4.2.3. The standby power supply shall be capable of operating the emergency responder radio coverage system at 100 percent system operation capacity for a duration of not less than ~~24~~ 12 hours.

Reason: In the 2009 IFC the standby power requirements were 12 hours. The requirements in the 2012 IFC to the standby power requirements were changed to 24 hours to align with other fire safety systems such as fire alarms with no real experience or technical justification. The capacity necessary for providing 24 hour battery backup for emergency responder radio enhancement systems is far more significant that that of other systems and can require large battery banks on multiple floors of a building. Other national standards and industry practices utilize 12 hours as the standard and this change brings consistency to backup battery requirements for design professional and the fire code officials.

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

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal, which is similar to code change proposal F56-16, allows the use of available standby power generators in lieu of 12 hours provided strictly from batteries. Note that the duration also has changed from 24 to 12 hours as in code change proposal F56-16.

Analysis: Note that proposals F56-16 and F57-16 should be coordinated as they provide slightly different approaches to the same subject.

Assembly Action: **None**

Final Action Results

F57-16	**AS**

Code Change No: F75-16

Original Proposal

Section(s): 105.7.9 (New), 202, 202 (New), 604.2.6 (New) (IBC [F] 2702.2.6 (New)), 606.8, 606.8.1 (New), 901.5, 901.6, 902.1, 908.1 (IBC [F] 908.1), 908.2 (IBC [F] 908.2), 908.3 (IBC [F] 908.3)] 908.3.1 (IBC [F] 908.3.1), 908.3.2 (IBC [F] 908.3.2), 908.3.3 ([F] 908.3.3), 908.4 (IBC [F] 908.4), 908.5 (IBC [F] 908.5), 908.6 (IBC [F] 908.6), 908.7 (IBC [F] 908.7), 916.(New) (IBC [F] 916 (New)), 2308.2.2, 2309.2.2, 2311.7.1.1, 2311.7.1.2, 2311.7.2, 2311.7.2.2, 2311.7.2.1, 2311.7.2.1.1, 2311.7.2.3, 2702.1, 2703.1.3, 2703.13, 2703.13.1, 2703.13.1.1, 2703.13.1.2, 2703.13.1.3, 2703.13.1.4, 2703.13.2, 5307.5, 5307.5.2, 5808.5, 5808.5.3, 5808.5.1, 5808.5.2, 5808.5.4, 6004.2.2.7, 6004.2.2.10, 6004.2.2.10.1, 6004.2.2.10.2, 6004.2.2.10.3, 6004.2.2.10.4, 6005.3.2, 6005.5, 6204.1.11; IBC [F] 406.8.5, [F] 406.8.5.1, [F] 406.8.5.1.1, [F] 406.8.5.2, [F] 406.8.5.3, [F] 415.2, [F] 415.11.7, [F] 415.11.7.1, [F] 415.11.7.1.1, [F] 415.11.7.1.2, [F] 415.11.7.1.3, [F] 415.11.7.1.4, [F] 415.11.7.2, [F] 415.11.9.3, [F] 421.6, [F] 421.6.3, [F] 421.6.1, [F] 421.6.4, [F] 421.6.2

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

Add new text as follows:

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

Delete without substitution:

SECTION 202 DEFINITIONS

~~**202 CONTINUOUS GAS DETECTION SYSTEM.** A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis at intervals not to exceed 30 minutes.~~

Add new definition as follows:

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

Delete without substitution:

~~202 GAS DETECTION SYSTEM, CONTINUOUS.~~
~~See "Continuous gas detection system."~~

Add new definition as follows:

HPM. See "Hazardous Production Material."

Add new text as follows:

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

Revise as follows:

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

Add new text as follows:

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

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

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

Revise as follows:

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

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

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

ALARM NOTIFICATION APPLIANCE.
ALARM SIGNAL.
ALARM VERIFICATION FEATURE.
ANNUNCIATOR.
AUDIBLE ALARM NOTIFICATION APPLIANCE.
AUTOMATIC.
AUTOMATIC FIRE-EXTINGUISHING SYSTEM.
AUTOMATIC SMOKE DETECTION SYSTEM.

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

WET-CHEMICAL EXTINGUISHING AGENT.
WIRELESS PROTECTION SYSTEM.
ZONE.
ZONE, NOTIFICATION.

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

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

Delete without substitution:

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

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

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

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

~~**908.7 Carbon dioxide (CO_2) systems.** Emergency alarm systems in accordance with Section 5307.5.2 shall be provided where required for compliance with Section 5307.5.~~

Add new text as follows:

SECTION 916
GAS DETECTION SYSTEMS

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

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

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

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

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

916.5 Emergency and standby power. Where standby or emergency power is not required elsewhere by this code, standby or emergency power shall be provided or the gas detection system shall initiate a trouble signal at an approved location if the power supply is interrupted.

916.6 Sensor locations. Where a specific location for sensors is not specified elsewhere by this code, sensors shall be installed in approved locations where leaking gases are expected to accumulate.

916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:

1. For HPM gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic gases, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7.
3. Where a less frequent or delayed sampling interval is *approved*.

916.8 System activation. A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding the threshold specified by the section of this code requiring a *gas detection system*.

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

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

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

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

Revise as follows:

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

2309.2.2 Listed or approved equipment. Hoses, hose connections, compressors, hydrogen generators, dispensers~~, detection systems~~ and electrical equipment used for hydrogen shall be *listed* or *approved* for use with hydrogen. Hydrogen motor-fueling connections shall be *listed* and *labeled* or *approved* for use with hydrogen.

2311.7.1.1 Design. ~~Indoor~~ For indoor locations ~~shall be ventilated utilizing,~~ air supply inlets and exhaust outlets for mechanical ventilation shall be arranged to provide ~~uniform~~ uniformly distributed air movement ~~to the extent practical. Inlets shall be~~, with inlets uniformly arranged on exterior walls near floor level~~. Outlets shall be~~ and outlets located at the high point of the room in exterior walls or the roof.

~~Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system or, for hydrogen, a continuously monitoring flammable gas detection system, each activating at a gas concentration of not more than 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure~~

Failure of the ventilation system shall cause the fueling system to shut down.

The ventilation rate shall be not less than 1 cubic foot per minute [0.03 m^3/minute] per 12 cubic feet [~~0.001390~~0.34 m^3 ~~× (s · m^3)~~] of room volume.

2311.7.1.2 Operation. The mechanical ventilation system shall operate continuously.

Exceptions:

1. Mechanical ventilation systems that are interlocked with a gas detection system designed in accordance with Sections 2311.7.2 through ~~2311.7.2.3~~ 2311.7.2.2.
2. Mechanical ventilation systems in repair garages that are used only for repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the ventilation system is electrically interlocked with the lighting circuit.

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

~~2311.7.2.2~~ 2311.7.2.1 ~~Operation~~ System activation. Activation of ~~the~~a gas detection ~~system~~ alarm shall result in all of the following:

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

Delete without substitution:

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

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

Revise as follows:

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

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

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

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

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

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

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

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

2703.13.1.2 HPM rooms. A ~~continuous~~ gas detection system shall be provided in HPM rooms where HPM gas is used in the room.

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

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

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

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

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

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

5307.5.2 ~~Emergency alarm~~ Gas detection system. ~~An emergency alarm~~ A *gas detection system* complying with Section 916 shall be provided to monitor areas where carbon dioxide can accumulate. The system shall ~~comply with all~~be designed to initiate a local audible and visible alarm in the room or area in which the sensor is installed when the level of ~~the following:~~ carbon dioxide exceeds 5,000 parts per million (9,000 mg/m3).

~~1. Continuous gas detection shall be provided to monitor areas where carbon dioxide can accumulate.~~
~~2. The threshold for activation of an alarm shall not exceed 5,000 parts per million (9,000 mg/m3).~~
~~3. Activation of the emergency alarm system shall initiate a local alarm within the room or area in which the system is installed.~~

5808.5 Gas detection system. Hydrogen fuel gas rooms shall be provided with ~~an approved flammable gas detection system in accordance~~ a *gas detection system* that complies with Sections 916, and Sections 5808.5.1 ~~through 5808.5.4~~ and 5808.5.2.

~~**5808.5.3**~~ **5808.5.1 ~~Operation~~ System activation.** Activation of ~~the~~ a gas detection ~~system~~ alarm shall result in both of the following:

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

Delete without substitution:

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

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

Revise as follows:

~~**5808.5.4**~~ **5808.5.2 Failure of the gas detection system.** Failure of the ~~gas detection system~~ *gas detection system* shall ~~result in activation of~~ automatically activate the mechanical exhaust ventilation system, ~~cessation of~~ stop hydrogen generation, and ~~the sounding of~~ cause a trouble signal ~~in~~to sound at an approved location.

6004.2.2.7 Treatment systems. The exhaust ventilation from gas cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 6004.2.2.4 and 6004.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 6004.2.2.7.1 through 6004.2.2.7.5 and Section 510 of the *International Mechanical Code*.

Exceptions:

1. Highly toxic and toxic gases—storage. A treatment system is not required for cylinders, containers and tanks in storage where all of the following controls are provided:
   1.1. Valve outlets are equipped with gas-tight outlet plugs or caps.
   1.2. Handwheel-operated valves have handles secured to prevent movement.
   1.3. *Approved* containment vessels or containment systems are provided in accordance with Section 6004.2.2.3.
2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where the following are provided:
   2.1. A *listed* or *approved* gas detection system with a sensing interval not exceeding 5 minutes.
   2.2. A *listed* or *approved* automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection system shall comply with Section 6004.2.2.10.
3. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where a *gas detection system* complying with Section 6004.2.2.10 and listed or *approved* automatic-closing fail-safe valves are provided. The *gas detection system* shall have a sensing interval not exceeding 5 minutes. Automatic-closing fail-safe valves shall be located immediately adjacent to cylinder valves and shall close when gas is detected at the permissible exposure limit (PEL) by a gas sensor monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room.

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

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

Delete without substitution:

~~**6004.2.2.10.1 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017, or approved. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected, or approved.~~

Revise as follows:

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

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

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

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

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

~~**6004.2.2.10.4**~~ **6004.2.2.10.3 Valve closure.** Automatic closure of shutoff valves shall be in accordance with the following:

1. Where the gas-detection sampling point initiating the ~~gas detection system~~ *gas detection system* alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.
2. Where the gas-detection sampling point initiating the ~~gas detection system~~ *gas detection system* alarm is within a gas room and *compressed gas* containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.
3. Where the gas-detection sampling point initiating the ~~gas detection system~~ *gas detection system* alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.

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

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

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

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

1. When the dissolved ozone concentration in the water being treated is above saturation when measured at the point where the water is exposed to the atmosphere.
2. When the process using generated ozone is shut down.
3. ~~When the gas detection system detects ozone.~~
3. Failure of the ventilation system for the cabinet or ozone-generator room.
4. Failure of the ~~gas detection system~~ *gas detection system* in an ozone-gas generator room.

6204.1.11 Standby power. Standby power shall be provided in accordance with Section 604 for the following systems used to protect Class I and unclassified detonable organic peroxide:

1. Exhaust ventilation system.
2. Treatment system.
3. ~~Gas detection system.~~
3. Smoke detection system.
4. Temperature control system.
5. Fire alarm system.
6. Emergency alarm system.

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Delete without substitution:

~~**202 [F] CONTINUOUS GAS DETECTION SYSTEM.** A gas detection system where the analytical instrument is maintained in continuous operation and sampling is performed without interruption. Analysis is allowed to be performed on a cyclical basis at intervals not to exceed 30 minutes.~~

Add new definition as follows:

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

Revise as follows:

[F] 406.8.5 Gas detection system. Repair garages used for ~~the~~ repair of vehicles fueled by nonodorized gases ~~such as~~, including but not limited to hydrogen and nonodorized LNG, shall be provided with a ~~flammable~~ gas detection system that complies with Section 916. The gas detection system shall be designed to detect leakage of nonodorized gaseous fuel. Where lubrication or chassis service pits are provided in garages used for repairing nonodorized LNG-fueled vehicles, gas sensors shall be provided in such pits.

[F] ~~406.8.5.2~~ 406.8.5.1 ~~Operation~~ System activation. Activation of ~~the~~ a gas detection ~~system~~ alarm shall result in all of the following:

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

[F] ~~406.8.5.3~~ 406.8.5.2 Failure of the gas detection system. Failure of the *gas detection system* shall ~~result in the deactivation of~~ automatically deactivate the heating system, ~~activation of~~ activate the mechanical ventilation system where the system is interlocked with the *gas detection system*, and cause a trouble signal to sound ~~in~~ at an approved location.

Delete without substitution:

~~**[F] 406.8.5.1 System design.** The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used by vehicles to be repaired. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL). Gas detection shall be provided in lubrication or chassis service pits of repair garages used for repairing nonodorized LNG-fueled vehicles.~~

~~**[F] 406.8.5.1.1 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.~~

Revise as follows:

[F] 415.2 Definitions. The following terms are defined in Chapter 2:

CONTINUOUS GAS DETECTION SYSTEM.
DETACHED BUILDING.
EMERGENCY CONTROL STATION.
EXHAUSTED ENCLOSURE.
FABRICATION AREA.
FLAMMABLE VAPORS OR FUMES.
GAS CABINET.
GAS DETECTION SYSTEM.
GASROOM.
HAZARDOUS PRODUCTION MATERIAL (HPM).
HPM.
HPM FLAMMABLE LIQUID.
HPM ROOM.
IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH).
LIQUID.
LIQUID STORAGE ROOM.
LIQUID USE, DISPENSING AND MIXING ROOM.
LOWER FLAMMABLE LIMIT (LFL).
NORMAL TEMPERATURE AND PRESSURE (NTP).
PHYSIOLOGICAL WARNING THRESHOLD LEVEL.
SERVICE CORRIDOR.
SOLID.
STORAGE, HAZARDOUS MATERIALS.
USE (MATERIAL).
WORKSTATION.

[F] 415.11.7 ~~Continuous gas~~ Gas detection systems. A ~~continuous gas detection system~~ gas detection system complying with Section 916 shall be provided for HPM gases where the physiological warning threshold level of the gas is at a higher level than the accepted permissible exposure limit (PEL) for the gas and for flammable gases in accordance with Sections 415.11.7.1 ~~and~~ through 415.11.7.2.

[F] 415.11.7.1 Where required. A ~~continuous gas detection system~~ shall be provided in the areas identified in Sections 415.11.7.1.1 through 415.11.7.1.4.

[F] 415.11.7.1.1 Fabrication areas. A ~~continuous gas detection system~~ shall be provided in *fabrication areas* where HPM gas is used in the *fabrication area*.

[F] 415.11.7.1.2 HPM rooms. A ~~continuous gas detection system~~ shall be provided in HPM rooms where HPM gas is used in the room.

[F] 415.11.7.1.3 Gas cabinets, exhausted enclosures and gas rooms. A ~~continuous gas detection system~~ shall be provided in gas cabinets and exhausted enclosures for HPM gas. A ~~continuous gas detection system~~ shall be provided in gas rooms where HPM gases are not located in gas cabinets or exhausted enclosures.

[F] 415.11.7.1.4 Corridors. Where HPM gases are transported in piping placed within the space defined by the walls of a *corridor* and the floor or roof above the *corridor*, a ~~continuous gas detection system~~ shall be provided where piping is located and in the *corridor*.

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

[F] 415.11.7.2 Gas detection system operation. The ~~continuous gas detection system~~ shall be capable of monitoring the room, area or equipment in which the HPM gas is located at or below all the following gas concentrations:

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

[F] 415.11.9.3 Signals. The *emergency control station* shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems shall include, but not be limited to, the following where such equipment or systems are required to be provided either in this chapter or elsewhere in this code:

1. *Automatic sprinkler system* alarm and monitoring systems.
2. Manual *fire alarm* systems.
3. *Emergency alarm systems.*
4. ~~Continuous gas~~ *Gas detection systems.*
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4 of the *International Fire Code*.
8. Exhaust *ventilation* flow alarm devices for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust *ventilation* systems required in Section 2705.2.3.4 of the *International Fire Code*.

[F] 421.6 Gas detection system. Hydrogen fuel gas rooms shall be provided with ~~an approved flammable gas detection system in accordance~~ a *gas detection system* that complies with Sections 916, and Sections 421.6.1 through ~~421.6.4~~421.6.2.

[F] ~~421.6.3~~ 421.6.1 ~~Operation~~ System activation. Activation of ~~the~~ a gas detection ~~system~~ alarm shall result in ~~all~~ both of the following:

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

Delete without substitution:

~~**[F] 421.6.1 System design.** The flammable gas detection system shall be listed for use with hydrogen and any other flammable gases used in the hydrogen fuel gas room. The gas detection system shall be designed to activate when the level of flammable gas exceeds 25 percent of the lower flammability limit (LFL) for the gas or mixtures present at their anticipated temperature and pressure.~~

Revise as follows:

~~[F]~~ ~~421.6.4~~ 421.6.2 Failure of the gas detection system. Failure of the ~~gas detection system~~ *gas detection system* shall ~~result in activation of~~ automatically activate the mechanical exhaust ventilation system, ~~cessation of~~ stop hydrogen generation, and ~~the sounding of~~ cause a trouble signal ~~in~~to sound at an approved location.

Delete without substitution:

~~**[F] 421.6.2 Gas detection system components.** Gas detection system control units shall be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.~~

Reason: Gas detection systems are required for many different applications in the code. There is great inconsistency in how these systems are treated, and some requirements cannot be enforced because required listed gas detectors, controls and systems are not commercially available. A working group of the Fire Code Action Committee that included industry and code officials worked on developing this proposal that addresses these concerns. The significant changes accomplished with this proposal are as follows:

- Section 105.7.9 - A construction permit is required for installation of *gas detection systems*.
- Section 202 – A definition of gas detection system was added that replaces the Continuous Gas Detection System definition. Continuous gas sampling is addressed further in Section 916.6.
- Section 604.2.6 - Gas detection systems are required to be provided with emergency or standby power. By default, Section 604 requires minimum 2 hours' duration. An option for providing a power loss trouble signal in an approved location in lieu of standby power is included in Section 916.5.
- Section 606.8 requires ammonia refrigerant systems to comply with the IIAR 2 standard, which is already referenced in Section 606.
- In Section 908 only items 1 and 2 apply to emergency alarm systems, items 3 through 7 really reference gas detection systems. The unnecessary/incorrect cross references were deleted.
- Section 916 includes basic requirements for all gas detection systems and covers construction documents, equipment, power connections, emergency and standby power, sensor locations, gas sampling, system activation, signage, fire alarm system connections, maintenance, testing and sensor calibration. These are important safety requirements that are applicable to all gas detection systems, including those installed in a small mom and pop operation up to those in large industrial facilities. Gas detection system equipment is commercially available that can comply with these requirements.
- Most of the revisions in Sections 23 through 64 accomplished the following: (1) deleted references to listed detectors and equipment, (2) provided consistency in how gas detection requirements are treated, (3) included cross references to Section 916 for basic system requirements, and (4) clarified existing requirements.

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

Cost Impact: Will increase the cost of construction
The additional construction requirements in this proposal have the potential to increase construction costs. However, since the features described in Section 916 are currently available with most gas detection equipment on the market today, the additional costs may not be significant.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: This proposal was approved based upon the proponent's reason statement.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

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

[F] HPM. See "Hazardous Production Material."

[F] 415.5.3 Supervision. Emergency alarm systems required by Section 415.5.1 or 415.5.2 shall be electrically supervised and monitored by an approved central, proprietary or remote station service or shall initiate an audible and visual signal at a constantly attended on-site location.

[F] 415.5.4 Emergency alarm systems. *Emergency alarm systems* required by Section 415.5.1 or 415.5.2 shall be provided with emergency or standby power in accordance with Section ~~2702~~ 2702.2.8 and 2702.2.14.

[F] 908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be provided in accordance with Section 415.5.

[F] 908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in an HPM facility shall be provided as required in Section 415.11.3.5. ~~A continuous gas detection system shall be provided for HPM gases in accordance with Section 415.11.7.~~

~~**[F] 908.3 Highly toxic and toxic materials.** A gas detection system shall be provided to detect the presence of *highly toxic* or *toxic* gas at or below the permissible exposure limit (PEL) or ceiling limit of the gas for which detection is provided. The system shall be capable of monitoring the discharge from the treatment system at or below one-half the immediately dangerous to life and health (IDLH) limit.~~

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

~~**[F] 908.3.1 Alarms.** The gas detection system shall initiate a local alarm and transmit a signal to a constantly attended control station when a short-term hazard condition is detected. The alarm shall be both visible and audible and shall provide warning both inside and outside the area where gas is detected. The audible alarm shall be distinct from all other alarms.~~

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

~~**[F] 908.3.2 Shutoff of gas supply.** The gas detection system shall automatically close the shutoff valve at the source on gas supply piping and tubing related to the system being monitored for whichever gas is detected.~~

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

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

~~**[F] 908.3.3 Valve closure.** The automatic closure of shutoff valves shall be in accordance with the following:~~

1. ~~When the gas-detection sampling point initiating the gas detection system alarm is within a gas cabinet or exhausted enclosure, the shutoff valve in the gas cabinet or exhausted enclosure for the specific gas detected shall automatically close.~~
2. ~~Where the gas-detection sampling point initiating the gas detection system alarm is within a gas room and compressed gas containers are not in gas cabinets or exhausted enclosures, the shutoff valves on all gas lines for the specific gas detected shall automatically close.~~
3. ~~Where the gas-detection sampling point initiating the gas detection system alarm is within a piping distribution manifold enclosure, the shutoff valve for the compressed container of specific gas detected supplying the manifold shall automatically close.~~

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

~~**[F] 908.4 Ozone gas-generator rooms.** Ozone gas-generator rooms shall be equipped with a continuous gas detection system that will shut off the generator and sound a local alarm when concentrations above the PEL occur.~~

~~**[F] 908.5 Repair garages.** A flammable-gas detection system shall be provided in repair garages for vehicles fueled by nonodorized gases in accordance with Section 406.8.5.~~

~~**[F] 908.6 Refrigerant detector.** Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The detector, or a sampling tube that draws air to the detector, shall be located in an area where refrigerant from a leak will concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values for the refrigerant classification shown in the *International Mechanical Code* for the refrigerant classification. Detectors and alarms shall be placed in *approved* locations. The detector shall transmit a signal to an *approved* location.~~

~~**[F] 908.7 Carbon dioxide (CO_2) systems.** Emergency alarm systems in accordance with Section 5307.5.2 of the *International Fire Code* shall be provided where required for compliance with Section 5307.5 of the *International Fire Code*.~~

SECTION 916
GAS DETECTION SYSTEMS

[F] 916.1 General. *Gas detection systems* required by this code shall comply with Sections 916.2 through 916.11.

[F] 916.2 Construction documents. Documentation of the *gas detection system* design and equipment to be used that is adequate to demonstrate compliance with the requirements of this code shall be provided with the application for permit.

[F] 916.3 Equipment. *Gas detection system* equipment shall be designed for use with the gases being detected and shall be installed in accordance with manufacturers' instructions.

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

[F] 916.5 Emergency and standby power. Where standby or emergency power is not required elsewhere by this code, standby or emergency power shall be provided or the gas detection system shall initiate a trouble signal at an approved location if the power supply is interrupted.

[F] 916.6 Sensor locations. Where a specific location for sensors is not specified elsewhere by this code, sensors shall be installed in approved locations where leaking gases are expected to accumulate.

[F] 916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:

1. For *HPM* gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic gases that are not *HPM*, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7 of the *International Fire Code*.
3. Where a less frequent or delayed sampling interval is approved.

[F] 916.8 System activation. A gas detection alarm shall be initiated where any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding the threshold specified by the section of this code requiring a gas detection system.

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

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

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

[F] 916.11 Inspection, testing and sensor calibration. *Gas detection systems* and sensors shall be inspected, tested and calibrated in accordance with the *International Fire Code*.

~~**[F] 2702.2.1 Emergency alarm systems.** Emergency power shall be provided for emergency alarm systems as required by Section 415.5.~~

[F] 2702.2.6 Gas detection systems. Emergency or standby power shall be provided for *gas detection systems* in accordance with the *International Fire Code*.

2015 International Fire Code

~~**604.2.2 Emergency alarm systems.** Emergency power shall be provided for emergency alarm systems as required by Section 414 of the *International Building Code*.~~

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

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

Detection of a refrigerant concentration exceeding the detector's upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room in accordance with Section 606.9.1.

916.7 Gas sampling. Gas sampling shall be performed continuously. Sample analysis shall be processed immediately after sampling, except as follows:

1. For *HPM* gases, sample analysis shall be performed at intervals not exceeding 30 minutes.
2. For toxic ~~gases~~ gase that are not *HPM*, sample analysis shall be performed at intervals not exceeding 5 minutes in accordance with Section 6004.2.2.7.
3. Where a less frequent or delayed sampling interval is *approved*.

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

2311.7.1.1 Design. For indoor locations, air supply inlets and exhaust outlets for mechanical ventilation shall be arranged to provide uniformly distributed air movement, with inlets uniformly arranged on walls near floor level and outlets located at the high point of the room in walls or the roof.

Failure of the ventilation system shall cause the fueling system to shut down. The exhaust ventilation rate shall be not less than 1 cubic foot per minute [0.03 m^3/minute] per 12 cubic feet [0.34 m^3] of room volume.

6004.2.2.7 Treatment systems. The exhaust ventilation from gas cabinets, exhausted enclosures and gas rooms, and local exhaust systems required in Sections 6004.2.2.4 and 6004.2.2.5 shall be directed to a treatment system. The treatment system shall be utilized to handle the accidental release of gas and to process exhaust ventilation. The treatment system shall be designed in accordance with Sections 6004.2.2.7.1 through 6004.2.2.7.5 and Section 510 of the *International Mechanical Code*.

Exceptions:

1. Highly toxic and toxic gases—storage. A treatment system is not required for cylinders, containers and tanks in storage where all of the following controls are provided:
   1.1 Valve outlets are equipped with gas-tight outlet plugs or caps.
   1.2. Handwheel-operated valves have handles secured to prevent movement.
   1.3. Approved containment vessels or containment systems are provided in accordance with Section 6004.2.2.3.
2. ~~Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where the following are provided:~~
   ~~2.1. A *listed* or *approved* gas detection system with a sensing interval not exceeding 5 minutes.~~
   ~~2.2. A *listed* or *approved* automatic-closing fail-safe valve located immediately adjacent to cylinder valves. The fail-safe valve shall close when gas is detected at the permissible exposure limit (PEL) by a gas detection system monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room. The gas detection system shall comply with Section 6004.2.2.10.~~
2. Toxic gases—use. Treatment systems are not required for toxic gases supplied by cylinders or portable tanks not exceeding 1,700 pounds (772 kg) water capacity where a *gas detection system* complying with Section 6004.2.2.10 and listed or *approved* automatic-closing fail-safe valves are provided. The *gas detection system* shall have a sensing interval not exceeding 5 minutes. Automatic-closing fail-safe valves shall be located immediately adjacent to cylinder valves and shall close when gas is detected at the permissible exposure limit (PEL) by a gas sensor monitoring the exhaust system at the point of discharge from the gas cabinet, exhausted enclosure, ventilated enclosure or gas room.

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

1. When the dissolved ozone concentration in the water being treated is above saturation when measured at the point where the water is exposed to the atmosphere.
2. When the process using generated ozone is shut down.
3. Failure of the ventilation system for the cabinet or ozone-generator room.
4. Detection of ozone at concentrations above the permissible exposure limit (PEL) or failure of the *gas detection system* in an ozone-gas generator room.

2015 International Mechanical Code

[F] 502.16.1 Design. ~~Indoor~~ For indoor locations ~~shall be ventilated utilizing~~ air supply inlets and exhaust outlets for mechanical ventilation shall be arranged to provide ~~uniform~~ uniformly distributed air movement ~~to the extent practical. Inlets shall be~~ with inlets uniformly arranged on ~~exterior~~ walls near floor level~~. Outlets shall be~~ and outlets located at the high point of the room in ~~exterior~~ walls or the roof.

~~Ventilation shall be by a continuous mechanical ventilation system or by a mechanical ventilation system activated by a continuously monitoring natural gas detection system, or for hydrogen, a continuously monitoring flammable gas detection system, each activating at a gas concentration of 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure~~ Failure of the ventilation system shall cause the fueling system to shut down.

The exhaust ventilation rate shall be not less than 1 cubic foot per minute [0.03 m^3/minute] per 12 cubic feet [~~0.00138 m~~0.34m^3/~~(s • m^3)~~] of room volume.

Commenter's Reason: F75-16 was approved as submitted and included a complete rewrite of IFC gas detection system requirements. The proposal did not include some of the changes needed for correlation of corresponding IBC gas detection system requirements. This public comment makes those additional changes, all of which are denoted with [F] designations as being maintained by the IFC committee. With the exception of correcting a single item in IFC Section 6005.5 that was not copied when the original proposal was entered into cdpACCESS changes are for code correlation and clean-up with no intended technical changes to what was already approved in the original proposal and current IFC/IBC/IMC requirements, including:

1. Changes to Section 415.5.3, which relate to supervision and monitoring, improve correlation with source requirements in IFC Sections 5004.10 and 5005.1.6.
2. Changes to Section 415.5.4 add recognition of standby power to improve correlation with source requirements in IFC Sections 5004.7 and 5005.1.5, which allow standby power in lieu of emergency power in most cases.
3. IFC Section 604.2.2 and IBC Section 2702.2.1 are being deleted because "emergency alarm systems" relate exclusively to hazardous materials storage and use and to semi-conductor manufacturing occupancies. Requirements for these occupancies are already provided by IFC Sections 604.2.8 and 604.2.14 and IBC Sections 2702.2.8 and 2702.2.14.
4. IBC Section 2702.2.6 is being added to correlate with the new IFC Section 604.2.4, which was added by the original F75-16 proposal.
5. IFC Section 916.7 is being revised to clarify that HPM toxic gases are covered by Item 1, not Item 2.
6. IFC Section 606.8.1 is being revised to correlate with the referenced requirement in Section 606.9.1, which also addresses the detector's upper detection limit.
7. Changes to IMC 502.16.1 are for correlation with IFC 2311.7.1.1. Also note that both sections were correlated with the revisions made in F274-16.

Final Action Results

F75-16	AMPC1

Code Change No: F79-16

Original Proposal

Section(s): 604.1.2 (IBC [F] 2702.1.2) (New)

Proponent: Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com)

Add new text as follows:

604.1.2 (IBC [F] 2702.1.2) Fuel line piping protection. Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by an approved method, or an assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

Reason: This proposal is intended to require fuel lines supplying a generator set inside a building to be separated with fire-resistance-rated construction from areas of the building other than in the room in which the generator is located. It mirrors the text that was approved for the 2015 IBC in Section 403.4.8.2 for high-rises and was overwhelmingly supported by the ICC membership.

This proposal extends the requirement to any building that has a generator that is separated from the rest of the building. It is common for diesel-fueled generators to supply the generators with a day tank and resupply the day tank via remote fuel oil tanks. The fuel line piping from those remote tanks to the generator can be exposed to the same fire incident that the generator has been protected against. Loss of the fuel line due to fire exposure has the same impact as loss of the generator itself.

The wording only refers to "fuel lines" to also provide protection in those cases where a gaseous fuel supply is approved for use.

Cost Impact: Will increase the cost of construction
This requirement for protection of the fuel lines supplying stationary generators already applies to high-rise buildings. This proposal, if approved, would require labor to install generic materials or a proprietary system to protect fuels lines in all buildings with stationary generators

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: This proposal was seen as over restrictive and too far reaching. The concerns related to the fact that the requirements would include all occupancies, all types of construction and not necessarily relate to the ratings required for the type of construction. Also there was concern that this would include supply piping that is normally empty.

Assembly Action: **None**

Public Comments

Public Comment 2:

Vickie Lovell, InterCode Incorporated, representing 3M (vickie@intercodeinc.com) requests Approve as Modified by this Public Comment.

Modify as follows:

604.1.2 (IBC [F] 2702.1.2) Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be separated from areas of the building other than the room the generator is located in by an approved method, or an assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1, the required fire-resistance rating shall be reduced to 1 hour.

Commenter's Reason: This proposal is intended to require fuel lines supplying a generator set inside a high-rise building to be separated with fire-resistance-rated construction from areas of the building other than in the room in which the generator is located.

The original proposal would have applied to all buildings; however, this modification limits the requirement to high-rise buildings. With this revision, it exactly mirrors the text that was approved for the 2015 IBC in Section 403.4.8.2 for high-rises and was overwhelmingly supported by the ICC membership.

It is common for diesel-fueled generators to supply the generators with a day tank and resupply the day tank via remote fuel oil tanks. The fuel line piping from those remote tanks to the generator can be exposed to the same fire incident that the generator has been protected against. Loss of the fuel line due to fire exposure has the same impact as loss of the generator itself. The wording only refers to "fuel lines" to also provide protection in those cases w here a gaseous fuel supply is approved for use.

This public comment is intended to correlate the 2015 IFC with the 2015 IBC section that contains the following new text in Chapter 4:

[F] 403.4.8.2 Fuel line piping protection. Fuel lines supplying a generator set inside a building shall be separated from areas of the building other than the room the generator is located in by an approved method or assembly that has a fire-resistance rating of not less than 2 hours. Where the building is protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the required fire-resistance rating shall be reduced to 1 hour.

Final Action Results

F79-16 **AMPC2**

Code Change No: F95-16

Original Proposal

Section(s): 105.6.44 (New), 202, 202 (New), , [A] 105.7.2, 602.1, 608, (New), 608.1, 608.1 (New), 608.1.1 (New), 608.1.2 (New), 608.1.3 (New), 608.1.3.1 (New), 608.1.3.2 (New), 608.1.3.3 (New), 608.1.4 (New), 608.1.5 (New), 608.1.6 (New), 608.1..6 (New), 608.1.7 (New), 608.2 (New), 608.2.1 (New), 608.2.2 (New), 608.2.3 (New), 608.2.4 (New), 608.2.5 (New), 608.2.5.1 (New), 608.2.6 (New), 608.2.6.1 (New), 608.2.6.2 (New), 608.2.7 (New), 608.2.7.1 (New), 608.2.7.2 (New), 608.2.7.3 (New), 608.2.7.4 (New), 608.3 (New), 608.3.1 (New), 608.4 (New), 608.4.1 (New), 608.4.2 (New), 608.4.3 (New), 608.4.4 (New), 608.4.5 (New), 608.4.6 (New), 608.4.7 (New), 608.4.8 (New), 608.5 (New), 608.5.1 (New), 608.5.1.1 (New), 608.5.2 (New), 608.5.3 (New), 608.5.3.1 (New), 608.5.3.2 (New), 608.5.4 (New), 608.5.4.1 (New), 608.5.5 (New), 608.6 (New), 608.6.1 (New), 608.6.2 (New), 608.6.3 (New), 608.6.4 (New), 608.6.5 (New), 608.6.6 (New), 907.2.23 (IBC [F] 907.2.23); IBC [F] 307.1.1, 509

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

Add new text as follows:

105.6.44 Stationary storage battery systems. A permit is required for the operation of a stationary storage battery system regulated by Section 608.

Revise as follows:

BATTERY TYPES.

~~**Lithium-ion**~~ **Flow battery.** A type of storage battery ~~that consists~~ which includes chemical components dissolved in two different liquids. Ion exchange, which provides the flow of ~~lithium ions embedded~~ electrical current, occurs through the membrane while both liquids circulate in ~~a carbon graphite or nickel metal-oxide substrate~~ their own respective space. ~~The electrolyte is a carbonate mixture or a gelled polymer. The lithium ions are the charge carriers of the battery.~~

~~**Lithium metal polymer**~~ **Lead acid battery.** A storage battery that is comprised of ~~nonaqueous~~ lead electrodes immersed in sulphuric acid electrolyte.

Lithium-ion battery. A storage battery with lithium ions serving as the charge carriers of the battery. The electrolyte is a polymer mixture of carbonates with an inorganic salt and can be in a liquid or a gelled polymer from. Lithiated metal oxide is typically a cathode and forms of carbon or ~~polymerized electrolytes, which provide ionic conductivity between lithiated positive active material electrically separated from metallic~~ graphite typically form the anode.

Lithium metal polymer battery. A storage battery that is similar to the lithium ion battery except that it has a lithium metal anode in the place of the traditional carbon or ~~lithiated negative active material~~ graphite anode

.

Nickel cadmium (Ni-Cd) battery. An alkaline storage battery in which the positive active material is nickel oxide, the negative contains cadmium and the electrolyte is potassium hydroxide.

~~**Nonrecombinant**~~ **Pre-engineered stationary storage battery system.** An energy storage system consisting of batteries, a battery management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

Prepackaged stationary storage battery system. An energy storage system consisting of batteries, a battery management system, components and modules that is factory assembled and shipped as a complete unit for installation at the job site.

Sodium-beta storage battery. A storage battery ~~in~~also referred to as Na-beta batteries or NBBs which~~, under conditions of normal use, hydrogen~~ uses a solid beta-alumina electrolyte membrane that selectively allows sodium ion transport between a positive electrode such as metal halide and ~~oxygen gasses created by electrolysis are vented into the air outside of the battery~~a negative sodium electrode.

~~**Recombinant battery.** A storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are converted back into water inside the battery instead of venting into the air outside of the battery.~~

~~**Stationary storage battery.**~~ A group of electrochemical cells interconnected to supply a nominal voltage of DC power to a suitably connected electrical load, designed for service in a permanent location.~~The number of cells connected in a series determines the nominal voltage rating of the battery. The size of the cells determines the discharge capacity of the entire battery. After discharge, it may be restored to a fully charged condition by an electric current flowing in a direction opposite to the flow of current when the battery is discharged.~~

~~**Valve-regulated lead-acid (VRLA) battery.** A lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. In VRLA batteries, the liquid electrolyte in the cells is immobilized in an absorptive glass mat (AGM cells or batteries) or by the addition of a gelling agent (gel cells or gelled batteries).~~

~~**Vented (flooded) lead-acid battery.** A lead-acid battery consisting of cells that have electrodes immersed in liquid electrolyte. Flooded lead-acid batteries have a provision for the user to add water to the cell and are equipped with a flame-arresting vent which permits the escape of hydrogen and oxygen gas from the cell in a diffused manner such that a spark, or other ignition source, outside the cell will not ignite the gases inside the cell.~~

Delete without substitution:

~~**202 BATTERY SYSTEM, STATIONARY LEAD-ACID.** A system which consists of three interconnected subsystems:~~

1. ~~A lead-acid battery.~~
2. ~~A battery charger.~~
3. ~~A collection of rectifiers, inverters, converters and associated electrical equipment as required for a particular application.~~

Add new definition as follows:

BATTERY SYSTEM, STATIONARY STORAGE. A rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls, and associated electrical equipment designed to provide electrical power to a building. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

ENERGY MANAGEMENT SYSTEM. An electronic system protects stationary storage batteries from operating outside its safe operating parameters, and generates alarm and trouble for off normal conditions.

STATIONARY BATTERY ARRAY – An arrangement of individual stationary storage batteries in close proximity to each other, mounted on storage racks or in modules, battery cabinets or other enclosures.

Revise as follows:

[A] 105.7.2 Battery systems. A construction permit is required to install stationary storage battery systems ~~having a liquid capacity of more than 50 gallons (189 L)~~regulated by Section 608.

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

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

SECTION 608
STATIONARY STORAGE BATTERY SYSTEMS

Delete and substitute as follows:

~~608.1 Scope.~~ ~~Stationary storage battery systems having an electrolyte capacity of more than 50 gallons (189 L) for flooded lead-acid, nickel cadmium (Ni-Cd) and valve-regulated lead-acid (VRLA), or more than 1,000 pounds (454 kg) for lithium-ion and lithium metal polymer, used for facility standby power, emergency power or uninterruptible power supplies shall comply with this section and Table 608.1.~~

Stationary storage battery systems having capacities exceeding the values shown in Table 608.1 shall comply with Section 608.1.2 through 608.6.6, as applicable.

TABLE 608.1
BATTERY STORAGE SYSTEM THRESHOLD QUANTITIES.

BATTERY TECHNOLOGY	CAPACITY[a]
Lead acid, all types	70 KWh (252 Megajoules)
Nickel cadmium (Ni-Cd)	70 KWh (252 Megajoules)
Lithium, all types	20 KWh (72 Megajoules)
Sodium, all types	20 KWh (72 Megajoules)[c]
Flow batteries[b]	20 KWh (72 Megajoules)
Other batter technologies	10 KWh (36 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 (252 Mega joules) for sodium-ion technologies

608.1.1 Permits. Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with Sections 105.6.44 and 105.7.2.

608.1.2 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room in which the stationary storage battery system is to be installed
2. Details on hourly fire-resistant rated assemblies provided
3. Quantities and types of storage batteries and battery systems.
4. Manufacturer's specifications, ratings and listings of storage batteries and battery systems
5. Details on energy management systems
6. Location and content of signage
7. Details on fire suppression, smoke detection and ventilation systems.
8. Rack storage arrangement, including seismic support criteria.

608.1.3 Hazard mitigation analysis. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Battery technologies not specifically identified in Table 608.1 are provided.
2. More than one stationary storage battery technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. When allowed as a basis for increasing maximum allowable quantities. See 608.3.

608.1.3.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the fire code official. Only single failure modes shall be considered.

1. Thermal runaway condition in a single battery storage rack, module or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the stationary battery storage system.
6. Failure of the smoke detection, fire suppression, or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.

608.1.3.2 Analysis approval. The fire code official is authorized to approve the hazardous mitigation analysis provided the consequences of the hazard mitigation analysis demonstrate:

1. Fires or explosions will be contained within unoccupied battery storage rooms for the minimum duration of the fire resistance rated walls identified in IBC table 509.1.
2. Fires and explosions in battery cabinets in occupied work centers will be detected in time to allow occupants within the room to safely evacuate.
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in access of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.
4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 25% of their lower flammability limit (LFL).
5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

608.1.3.3 Additional protection measures. Construction, equipment and systems that are required for the stationary storage battery system to comply with the hazardous mitigation analysis, including but not limited to those specifically described in Section 608.1, shall be installed, maintained and tested in accordance with nationally recognized standards and specified design parameters.

608.1.4 Seismic and structural design. 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.

608.1.5 Vehicle impact protection. Where stationary storage battery systems are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

608.1.6 Combustible storage. Combustible materials not related to the stationary storage battery system shall not be stored in battery rooms, cabinets or enclosures. Combustible materials in occupied work centers covered by Section 608.2.5 shall not be stored less than 3 feet (915 mm) from battery cabinets.

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608.1.7 Testing, maintenance and repairs. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any storage batteries or system components used to replace existing units shall be compatible with the battery charger, energy management systems, other storage batteries, and other safety systems. Introducing other types of storage batteries into the stationary storage battery system, or other types of electrolytes into flow battery systems shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

608.2 Location and construction. Rooms and areas containing stationary storage battery systems shall be designed, located and constructed in accordance with this section.

608.2.1 Location. Stationary storage battery systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

> **Exception:** Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations shall be permitted where approved by the fire code official.

608.2.2 Separation. Rooms containing stationary storage battery systems shall be separated from other areas of the building in accordance with Section 509.1 of the *International Building Code*. Battery systems shall be allowed to be in the same room with the equipment they support.

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

> **Exceptions:**
>
> 1. Lead acid storage battery arrays shall not exceed 250 KWh (900 Mega joules) each.
> 2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 150 KWh (540 Mega joules) each.

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

608.2.5 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

608.2.5.1 Cabinets. Where stationary batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

608.2.6 Signage Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.

1. A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with:CAUTION, WARNING or DANGER
   - 1.1. BATTERY ROOM ,
   - 1.2. AUTHORIZED PERSONNEL ONLY, and
   - 1.3. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.

   Exception: AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers complying with Section 608.2.5.

2. Hazard identification markings in accordance with NFPA 704.

608.2.6.1 Electrical disconnects. Where the stationary storage battery system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means indicating the location of stationary storage battery system disconnecting means in accordance with NFPA 70.

608.2.6.2 Cabinet signage. Battery storage cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that indicate CAUTION, BATTERY STORAGE CABINET, AUTHORIZED PERSONNEL ONLY, and the additional markings required in Section 608.6 for the types of storage batteries contained within the cabinet.

608.2.7 Outdoor installations. Stationary storage battery systems located outdoors shall comply with this Section, in addition to all applicable requirements of Section 608. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as battery storage rooms.

Exception: Stationary battery arrays in noncombustible containers shall not be required to be spaced three feet (914 mm) from the container walls.

608.2.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

608.2.7.2 Means of egress. Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

608.2.7.3 Security of outdoor areas. Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

608.2.7.4 Walk-in units Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

608.3 Maximum allowable quantities. Fire areas within buildings containing stationary storage batteries systems exceeding the maximum allowable quantities in Table 608.3 shall comply with all applicable High Hazard Group H occupancy requirements in this code and the International Building Code.

Exception: Where approved by the fire code official, areas containing stationary storage batteries that exceed the amounts in Table 608.3 shall be permitted to be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with 608.1.3 and large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

TABLE 608.3
MAXIMUM ALLOWABLE BATTERY QUANTITIES

BATTERY TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES[a]	GROUP H OCCUPANCY
Lead acid, all types	600 KWh	Group H-4
Nickel cadmium (Ni-Cd),	600 KWh	Group H-4
Lithium, all types	600 KWh	Group H-2
Sodium, all types	600 KWh	Group H-2
Flow batteries [b]	600 KWh	Group H-2
Other battery technologies	200 KWh	Group H-2 [c]

a. For batteries rated in Amp-Hours, Watt-hours (Wh) shall equal rated battery voltage times the Amp-hour rating divided by 1000
b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies
c. Shall be a Group H-4 occupancy if the fire code official determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard

608.3.1 Mixed battery systems. Where areas within buildings contain different types of storage battery technologies, the total aggregate quantities of batteries shall be determined based on the sum of percentages of each battery type quantity divided by the maximum allowable quantity of each battery type. If the sum of the percentages exceeds 100%, the area shall be treated as a high-hazard Group H occupancy in accordance with Table 608.3.

608.4 Storage batteries and equipment. The design and installation of storage batteries and related equipment shall comply with this sections 608.4.1 through 608.4.8.

608.4.1 Listings. Storage batteries and battery storage systems shall comply with all of the following:

1. Storage batteries shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary storage battery systems shall be listed in accordance with UL 9540.

Exception: Lead-acid batteries are not required to be listed.

608.4.2 Prepackaged and pre-engineered systems. Prepackaged and pre-engineered stationary storage battery systems shall be installed in accordance with their listing and the manufacturer's instructions.

608.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing cell voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

608.4.4 Battery chargers. Battery chargers shall be compatible with the battery chemistry and the manufacturer's electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged stationary storage battery system.

608.4.5 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.

608.4.6 Safety caps. Vented batteries shall be provided with flame-arresting safety caps.

608.4.7 Thermal runaway. Where required by Section 608.6 storage batteries shall be provided with a listed device or other approved method to prevent, detect and control thermal runaway.

608.4.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

608.5 Suppression and detection systems. Suppression and detectionsystems shall be provided in accordance with Sections 608.5.1 through 608.5.5.

608.5.1 Fire suppression systems. Rooms containing stationary storage battery systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

608.5.1.1 Alternative suppression systems. Battery systems that utilize water reactive materials shall be protected by an approved alternative automatic fire- extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of storage batteries in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

608.5.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing stationary storage battery systems in accordance with Section 907.2.

608.5.3 Mechanical ventilation. Where required by Section 608.6 or Section 608.1.4.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the *International Mechanical Code* and the following:

1. The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.
2. The system shall provide ventilation at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m3/(s • m2)] of floor area, but not less than 150 cfm (4 m3/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or 608.1.4.3 to be provided with ventilation, the cabinet shall be provided with mechanical ventilation in accordance with Section 608.5.3.

608.5.3.2 Supervision. Required mechanical ventilation systems for rooms and cabinets containing storage batteries shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visual signal at an approved constantly attended on-site location.

608.5.4 Gas detection system. Where required by Section 608.6 or 608.1.4.3, rooms containing stationary storage battery systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds the permissible exposure limits (PEL).

608.5.4.1 System activation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the battery storage room.
2. Transmission of an alarm to an approved location.
3. De-energizing of the battery charger.
4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

608.5.5 Spill control and neutralization. Where required by Section 608.6, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries containing free electrolyte as follows:

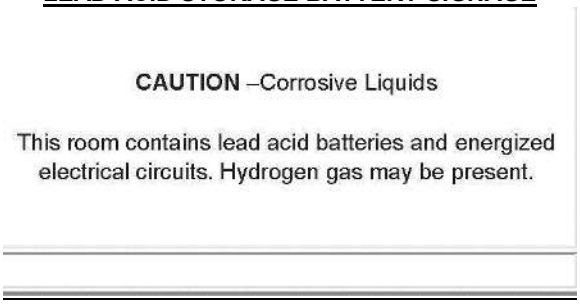
1. Spill control for battery systems containing more than 55 gallons (208 L) of electrolytes or other hazardous materials shall be provided in accordance with section 5004.2.1.
2. Neutralization materials or methods shall be provided that are capable of neutralizing a spill of the total capacity from the largest battery array or equipment to a pH between 5.0 and 9.0.

608.6 Specific battery type requirements. This section includes requirements applicable to specific types of storage batteries. Stationary storage battery systems with more than one type of storage battery shall comply with requirements applicable to each battery type.

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided:

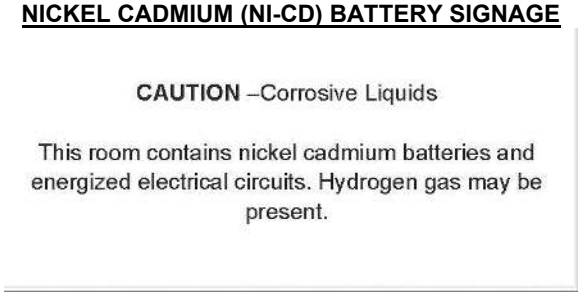
FIGURE 608.6.1
LEAD ACID STORAGE BATTERY SIGNAGE



608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

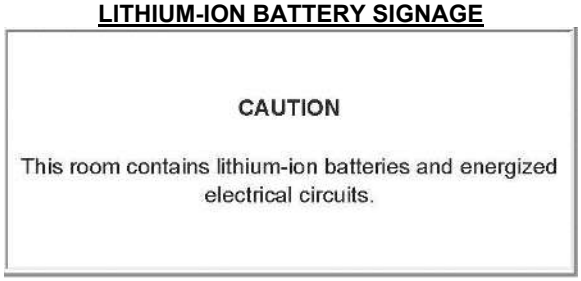
1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

FIGURE 608.6.2
NICKEL CADMIUM (NI-CD) BATTERY SIGNAGE



608.6.3 Lithium-ion storage batteries. Stationary battery systems utilizing lithium-ion storage batteries shall provide signage in accordance with Section 608.2. and the text in Figure 608.6.3.

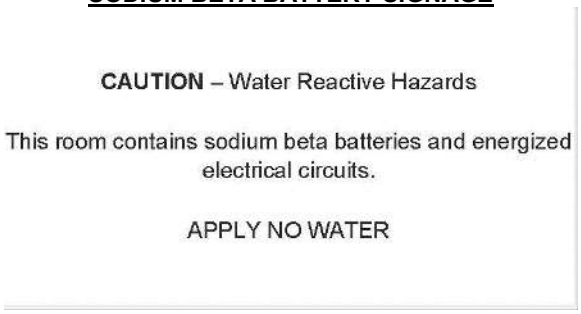
FIGURE 608.6.3
LITHIUM-ION BATTERY SIGNAGE



608.6.4 Sodium beta storage batteries. Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.

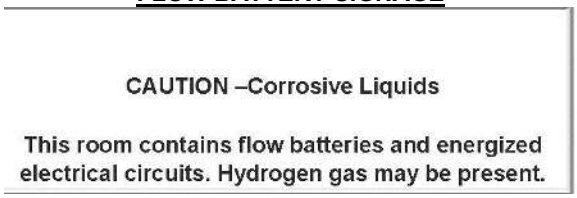
FIGURE 608.6.4
SODIUM BETA BATTERY SIGNAGE



608.6.5 Flow storage batteries. Stationary battery systems utilizing flow storage batteries shall comply with the following:

1. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:

FIGURE 608.6.5
FLOW BATTERY SIGNAGE



608.6.6 Other battery technologies. Stationary battery systems utilizing battery technologies other than those described in Sections 608.6.1 through 608.6.5 shall comply with the following:

1. Continuous flammable gas detection systems shall be provided in accordance with Section 608.5.4 where the batteries have the potential to produce toxic or highly toxic gases in the storage room or cabinet in excess of the permissible exposure limits (PEL) during charging, discharging and normal system operation.
2. Mechanical ventilation shall be provided in accordance with Section 608.5.3.
3. Spill control and neutralization shall be in accordance with Section 608.5.5.
4. In addition to the signage required in Section 608.2.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate the room contains energized electrical circuits.

Revise as follows:

907.2.23 Battery rooms. An automatic smoke detection system shall be installed in areas containing stationary storage battery systems ~~with a liquid capacity of more than 50 gallons (189 L)~~ as required in Section 608.

2015 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code*.~~
9. Stationary storage battery systems installed in accordance with the *International Fire Code*.
10. Corrosive personal or household products in their original packaging used in retail display.

11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.

TABLE 509
INCIDENTAL USES

ROOM OR AREA	SEPARATION AND/OR PROTECTION
Furnace room where any piece of equipment is over 400,000 Btu per hour input	1 hour or provide automatic sprinkler system
Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower	1 hour or provide automatic sprinkler system
Refrigerant machinery room	1 hour or provide automatic sprinkler system
Hydrogen fuel gas rooms, not classified as Group H	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.
Incinerator rooms	2 hours and provide automatic sprinkler system
Paint shops, not classified as Group H, located in occupancies other than Group F	2 hours; or 1 hour and provide automatic sprinkler system
In Group E occupancies, laboratories and vocational shops not classified as Group H	1 hour or provide automatic sprinkler system
In Group I-2 occupancies, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
In ambulatory care facilities, laboratories not classified as Group H	1 hour and provide automatic sprinkler system
Laundry rooms over 100 square feet	1 hour or provide automatic sprinkler system
In Group I-2, laundry rooms over 100 square feet	1 hour
Group I-3 cells and Group I-2 patient rooms equipped with padded surfaces	1 hour
In Group I-2, physical plant maintenance shops	1 hour
In ambulatory care facilities or Group I-2 occupancies, waste and linen collection rooms with containers that have an aggregate volume of 10 cubic feet or greater	1 hour
In other than ambulatory care facilities and Group I-2 occupancies, waste and linen collection rooms over 100 square feet	1 hour or provide automatic sprinkler system
In ambulatory care facilities or Group I-2 occupancies, storage rooms greater than 100 square feet	1 hour
Stationary storage battery systems having an energy ~~a liquid electrolyte~~ capacity greater than the threshold quantity specified in Table 608.1 of the *International Fire Code*. ~~of more than 50 gallons for flooded lead-acid, nickel-cadmium or VRLA, or more than 1,000 pounds for lithium-ion and lithium-metal polymer used for facility standby power, emergency power or uninterruptable power supplies~~	1 hour in Group B, F, M, S and U occupancies; 2 hours in Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

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

UL 1564 Standard for Industrial Battery Chargers.
UL 1973 Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
UL 9540 Standard for Energy Storage Systems and Equipment

Reason: When Section 608 was developed it primarily addressed hazards associated with stationary lead acid battery systems used for standby and emergency power. Advancements in battery technologies have introduced a new generation of battery technologies, such as lithium-ion and flow batteries, each with advantages and potential hazards.

Unfortunately the IFC/IBC have no specific requirements that regulate the use of these new battery technologies in occupancies and buildings, including high-rise and underground buildings. At the same time societal needs for energy solutions such as load shedding and load sharing, while well intentioned, have created a situation where thousands of pounds of storage batteries, and millions was watt-hours of stored energy systems can be installed with little if any building or fire official oversight. Providing protection for these new technologies and the huge amounts of energy they store is something that needs to be addressed through research, fire and fault condition testing, and the development of effective safety standards. Unfortunately much of this working, such as determining the ability of fire suppression systems to control thermal runaway of a large storage battery installation, still needs to be completed.

This proposal provides a complete rewrite of Section 608 and is an integral part of an energy storage system (ESS) set of IFC proposals. This proposal was developed with input from a Fire Code Action Committee Energy Storage System working group, which consisted of industry, representatives of government agencies, and the fire service. Comments on selected portions of the proposal:

105.7.2, 608.1.2, 608.1.3 A construction permit was added, along with details on the documentation needed to evaluate the construction.
Section 202 Definitions of two terms used in this Section were added for clarification.
608.1.1, Table 608.1 The scope of this section was revised to (1) add new battery technologies, (2) use Kilowatt-hour units which better describe the risk level (and use) compared to gallons of electrolyte or pounds of batteries, (3) establish threshold levels that are commensurate with the potential risks. The 70 KWh should approximate the existing 50 gallon electrolyte trigger for lead-acid batteries.
608.1.4 – 608.1.4.3 A hazardous mitigation analysis is required under certain identified circumstances to address uncertainties associated with new technologies and configurations. This section describes the fault considerations to be evaluated and the acceptance criteria to be achieved, information needed by both the design professional and the fire code official.
608.2.1 These location restrictions address concerns fire departments have with responding to incidents involving stationary storage battery systems, which include upper stories in high rise buildings and in stories identified as underground buildings.
608.2.2 Retains the hourly incidental use fire-resistance separation requirements in IBC Table 509.1.
608.2.3 To address unknowns on whether thermal runaways can proliferate unabated through a very large number of adjacent batteries in a storage room, a maximum 50 KWh limitation was proposed for individual arrays, or groups of adjacent batteries, which are required to be separated by three feet from other battery arrays or walls. To put this in perspective this 50 KWh is equivalent to 104 storage batteries, each rated 12V, 40 A-H. Exceptions for larger size arrays are provided for lead-acid batteries based on their track record over the years, and for listed pre-engineered and prepackaged storage battery systems.
608.2.4, 608.2.5 Sections based on current IFC requirements.
608.2.6 New signage requirements, which provide important information for facility personnel and emergency responders.
608.2.7 New requirements for outdoor installations that recognize installations are being provided in ISO and similar metal and noncombustible containers. An exception for not requiring 3 foot spacing from stationary battery arrays to the noncombustible walls recognizes that the container is not directly adjacent to an occupied portion of the building.
608.3 Scientific research and large scale fire and fault condition testing is not available to justify allowing unlimited quantities of storage batteries to be provided in mixed occupancy buildings using the incidental use provisions of the code. This section establishes a maximum 600 KWh MAQ for each fire area, which is equivalent to 1250 storage batteries, each rated 12V, 40 A-H. Quantities above this amount are only allowed in Group H occupancies.
An exception is provided for allowing larger quantities, when approved, based on large scale testing.
608.4 This section includes requirements that the storage batteries and related equipment must meet. This includes listing of the batteries and battery systems, which will address construction and safety performance requirements. Energy management systems are an important element of a safe system that monitor and takes actions on off normal conditions that could lead to problems.
608.4.8 This section covers battery technologies (many yet to hit the market) that produce toxic gases during charging, discharging and normal use, and triggers Chapter 60 safety requirements. There is no intent to address batteries that produce toxic gases during fires or abnormal conditions.
608.5.1 A significant challenge facing designers and code officials is a lack of large scale fire and fault condition test data that demonstrates that fire suppression systems can control battery fires. Until such protection arrangements are documented in NFPA 13 and other standards, this section allows the code official to approve suppression systems based on test data made available to him.

608.5.2 Existing requirement.
608.5.3 Mechanical ventilation requirements are consistent with existing IFC battery room and battery cabinet requirements. However in lieu of continuous ventilation they are allowed, ventilation is permitted to be provided upon activation of the gas detection system.
608.5.4 Gas detection systems must be provided if so required by the approved hazard mitigation analysis (Section 608.1.4.3) or by Section 608.6. They may also be provided to activate mechanical ventilation systems.
608.5.5 Spill control and neutralization requirements are based on existing stationary battery system requirements, and also applicable requirements for spill control for hazardous material liquids, included in Section 5004.2.1. This recognizes that in new battery technologies that spills of hazardous materials other than lead acid electrolyte might occur and need to be mitigated.
608.6 This section includes requirements for specific battery technologies, and includes criteria that address potential hazards associated with the type of technology involved. The protection requirements are customized for the potential hazards associated with the various battery technologies.

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

Cost Impact: Will increase the cost of construction
This proposal introduces a number of new requirements that cover stationary storage battery installations that were previously largely unregulated.

Analysis: A review of the standard(s) proposed for inclusion in the code, **UL 1564** Standard for Industrial Battery Chargers. **UL 1973** Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications and **UL 9540** Standard for Energy Storage Systems and Equipment 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 1, 2016.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

~~**105.6.44 Stationary storage battery systems.** A permit is required for the operation of a stationary storage battery system regulated by Section 608.~~

608.1.1 Permits. Permits shall be obtained for the installation and operation of stationary storage battery systems in accordance with ~~Sections 105.6.44 and~~ Section 105.7.2.

608.2.1 Location. Stationary storage battery systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

~~Exception~~ Exceptions:

1. Lead acid and nickel cadmium stationary storage battery systems.
2. Installations on noncombustible rooftops of buildings exceeding 75 feet (22 860 mm) in height that do not obstruct fire department rooftop operations shall be permitted where approved by the fire code official.

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium storage battery arrays ~~shall not exceed 250 KWh (900 Mega joules) each~~.
2. Listed pre-engineered lithium ion battery arrays shall not exceed 250 (900 Mega joules) each.
3. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed 150 KWh (540 Mega joules) each.
4. The fire code official is authorized to approve listed pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an

adjacent array, and be contained within the room for a duration equal to the fire resistance rating of the room separation specified in Table 509 of the International Building Code

608.2.6 Signage Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.

1. The room contains energized battery systems.
2. The room contains energized electrical circuits.
3. AUTHORIZED PERSONNEL ONLY, if required by Section 608.4.
4. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.
5. Hazard identification markings in accordance with NFPA 704.

Exception: Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

~~1. A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with:CAUTION, WARNING or DANGER~~
~~1.1. BATTERY ROOM ,~~
~~1.2. AUTHORIZED PERSONNEL ONLY, and~~
~~1.3. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.~~

~~**Exception: AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers complying with Section 608.2.5.**~~

~~2. Hazard identification markings in accordance with NFPA 704.~~

608.2.6.2 Cabinet signage. Battery storage cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that ~~indicate CAUTION, BATTERY STORAGE CABINET, AUTHORIZED PERSONNEL ONLY,~~ identify the manufacturer and ~~the additional markings required in Section 608.6 for~~ 9odel number of the ~~types~~ system and electrical rating (voltage and current) of ~~storage batteries~~ the contained battery system. There shall be signs within the cabinet that indicate the relevant electrical, chemical and hazards, as required by Section 608.6.

608.2.7.1 Separation. Stationary storage battery systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

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.

608.2.7.2 Means of egress. Stationary storage battery systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

TABLE 608.3
MAXIMUM ALLOWABLE BATTERY QUANTITIES

BATTERY TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES[a]	GROUP H OCCUPANCY
Lead acid, all types	~~600 KWh~~ unlimited	~~Group H-4~~ Not Applicable
Nickel cadmium (Ni-Cd),	~~600 KWh~~ unlimited	~~Group H-4~~ Not Applicable
Lithium, all types	600 KWh	Group H-2
Sodium, all types	600 KWh	Group H-2

BATTERY TECHNOLOGY	MAXIMUM ALLOWABLE QUANTITIES[a]	GROUP H OCCUPANCY
Flow batteries [b]	600 KWh	Group H-2
Other battery technologies	200 KWh	Group H-2 [c]

a. For batteries rated in Amp-Hours, Watt-hours (Wh) shall equal rated battery volta----------e times the Amp-hour rating divided by 1000
b. Shall include vanadium, zinc-bromine, polysulfide-bromide, and other flowing electrolyte type technologies
c. Shall be a Group H-4 occupancy if the fire code official determines that a fire or thermal runaway involving the battery technology does not represent a significant fire hazard

608.4.3 Energy management system. An approved energy management system shall be provided for battery technologies other than lead acid and nickel cadmium for monitoring and balancing cell voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

608.5.1 Fire suppression systems. Rooms containing stationary storage battery systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies of storage batteries shall be in accordance with Chapter 5 of NFPA 13. If the storage battery types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

Exception: Spaces or areas containing stationary storage battery systems used exclusively for telecommunications equipment in accordance with Section 903.2.

608.5.3 ~~Mechanical ventilation~~ Ventilation. Where required by Section 608.6 or Section 608.1.4.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the *International Mechanical Code* and the following:

1. The ventilation system shall ~~operate continuously or~~ be designed to ~~operate upon activation~~ limit the maximum concentration of flammable gas to 25% of the ~~gas detection system.~~ lower flammability limit, or for hydrogen 1.0 percent of the total volume of the room; or
2. ~~The system~~ Continuous ventilation shall ~~provide ventilation~~ be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m3/(s • m2)] of floor area, but not less than 150 cfm (4 m3/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or 608.1.4.3 to be provided with ventilation, the cabinet shall be provided with ~~mechanical~~ ventilation in accordance with Section 608.5.3.

608.5.4 Gas detection system. Where required by Section 608.6 or ~~608.1.4.3~~ 608.1.3, rooms containing stationary storage battery systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds 1/2 of the ~~permissible exposure limits (PEL)~~ IDLH.

608.5.4.1 System activation. Activation of the gas detection system shall result in all the following:

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 above.

608.5.5 Spill control and neutralization. Where required by Section 608.6, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries ~~containing free electrolyte~~ as follows:

1. ~~Spill control for battery systems containing more than 55 gallons (208 L) of electrolytes or other hazardous~~ For batteries with free-flowing electrolyte, method and materials shall be ~~provided in accordance with section 5004.2.1~~ capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.
2. ~~Neutralization materials or methods~~ For batteries with immobilized electrolyte, the method and material shall be ~~provided that are~~ capable of neutralizing a spill of 3.0 percent of the ~~total~~ capacity ~~from~~ of the largest ~~battery array~~ cell or ~~equipment~~ block in the room to a pH between 5.0 and 9.0.

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided:

608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
4. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.

608.6.4 Sodium beta storage batteries. Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.

608.6.5 Flow storage batteries. Stationary battery systems utilizing flow storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:

Committee Reason: The proposal was approved as it addresses the needs of new battery and energy systems with regard to safety. The modifications were primarily related to addressing two overall issues. These issues relate to recognizing the excellent safety record for the telecommunications industry and allowing them to continue to do business as usual. The other issue relates to providing flexibility to the quickly changing area of energy storage system technology where appropriate.

Section 105.6.44 and 608.1.1. The deletion of proposed section 105.6.44 from the proposal was due to the lack of need for such
permits. These systems will still require construction permits. This has not been necessary for the application of Section 608 in the past.

Section 608.1.2. A new exception was added for lead acid and nickel cadmium stationary storage battery systems as such a restriction was not seen as necessary based upon the lack of loss history. Limits on height in the building were not seen as necessary for these types of batteries.

Section 608.2.3. The array size limits were not necessary for lead acid and nickel cadmium batteries due to their good safety record and lack of experience with thermal runaway. A new exception 2 was added that recognizes the performance of listed lithium ion battery arrays not exceeding 250 KWhs based upon the performance of such arrays demonstrated by the listing. Also, a new exception 4 is added that allows for preengineered and prepackaged systems to be in larger arrays where large scale fire and fault condition testing demonstrate that fire will not spread to an adjacent array. This provides flexibility for the changing and evolving technologies and recognizes systems that are rigorously tested.

Section 608.2.6 and 608.2.6.2. Based upon concerns for many existing installations of lead acid and nickel cadmium batteries much of the existing signage language was placed back into the section.

Section 608.2.7.1 and 608.2.7.2. These modification recognize the concept of demonstrating performance of energy systems through full scale fire and fault condition tests. In this case it allows closer proximity to locations such as lot lines and means of egress. This provides flexibility for an industry that is evolving quickly.

Table 608.3. Consistent with other modifications this simply returns Table 608.3 to the 2015 allowance permitted for lead acid and nickel cadmium batteries due to the good safety records for such batteries. Limiting to 600 KWh and classifying as Group H-4 was not justified.

Section 608.4.3 This also relates to the good safety record for lead acid and nickel cadmium batteries. It was not felt to be necessary to provide an energy management system. These energy management systems are more critical to new technologies.

Section 608.5.1 This section would have required automatic sprinkler systems in accordance with NFPA 13. This is something that had not been previously required for lead acid and nickel cadmium batteries and was not seen as necessary now based upon the good safety record of such batteries. This also relates to the current exception in Section 903 for telecommunication facilities.

Sections 608.5.3, 608.5.3.1, 608.6.1, 608.6.2, 608.6.4, 608.6.5. The modifications to these sections was simply to recognize ventilation whether mechanical or nature. The current requirements in the 2015 IFC would not have mandated mechanical. The provisions have been revised to allow this but with the appropriate criteria. Clarification of the applicability of items 1 through 3 in Section 608.5.3 may be necessary. The intention is one of the following but the format of the section does not necessarily reflect this.

Section 608.5.4. The use of 1/2 IDLH is more consistent with a rewrite to gas detection systems. Also the criteria of PEL is considered too low and is unreasonable.

Section 608.5.4.1. This modification simply recognizes that previously with lead acid and nickel cadmium batteries that activation of the gas detection system simply activates the mechanical ventilation system and does not require compliance with the other actions such as transmission of an alarm. Again the justification for such a change in requirements was not provided.

Section 608.5.5. This modification makes the provisions related to neutralizing lead acid and nickel cadmium to what was previously allowed based upon the good safety record of such batteries. The proposal had made the requirements more restrictive without justification.

Assembly Action: **None**

Public Comments

Public Comment 2:

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

Further modify as follows:

608.2.3 Stationary battery arrays. Storage batteries, prepackaged stationary storage battery systems and pre-engineered stationary storage battery systems shall be segregated into stationary battery arrays not exceeding 50 KWh (180 Mega joules) each. Each stationary battery array shall be spaced a minimum three feet (914 mm) from other stationary battery arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exceptions:

1. Lead acid and nickel cadmium storage battery arrays.
2. ~~Listed pre-engineered lithium ion battery arrays shall not exceed 250 (900 Mega joules) each.~~
2. Listed pre-engineered stationary storage battery systems and prepackaged stationary storage battery systems shall not exceed ~~150~~ 250 KWh (~~540~~ 900 Mega joules) each.
3. The fire code official is authorized to approve listed pre-engineered and prepackaged battery arrays with larger capacities or smaller battery array spacing if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving one array will not propagate to an adjacent array, and be contained within the room for a duration equal to the fire resistance rating of the room separation specified in Table 509 of the International Building Code.

608.2.6 Signage Approved signs shall be provided on doors or in locations near entrances to stationary storage battery system rooms and shall include the following or equivalent.

1. The room contains energized battery systems.
2. The room contains energized electrical circuits.
3. ~~AUTHORIZED PERSONNEL ONLY, if required by Section 608.4.~~
3. The additional markings required in Section 608.6 for the types of storage batteries contained within the room.
4. ~~Hazard identification markings in accordance with NFPA 704.~~

Exception: Existing stationary storage battery systems shall be permitted to include the signage required at the time it was installed.

608.4.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic ~~materials~~ gas during charging, discharging and normal use conditions shall comply with Chapter 60.

608.5.3 ~~Mechanical ventilation~~ Ventilation. Where required by Section 608.6 or Section ~~608.1.4.3~~ 608.1.3, ventilation of rooms containing stationary storage battery systems shall be provided in accordance with the *International Mechanical Code* and the following:

1. ~~The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.~~
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; or
2. ~~The system~~ Continuous ventilation shall ~~provide ventilation~~ be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m3/(s • m2)] of floor area, but not less than 150 cfm (4 m3/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the ~~vault~~ ceiling for gases having a vapor density less than air.

608.5.3.1 Cabinet ventilation. Where cabinets located in occupied spaces contain the storage batteries that are required by Section 608.6 or ~~608.1.4.3~~ Section 608.1.3 to be provided with ventilation, the cabinet shall be provided with ~~mechanical~~ ventilation in accordance with Section 608.5.3.

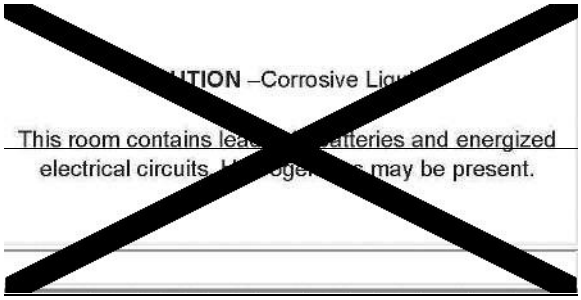
608.5.4 Gas detection system. Where required by Section 608.6 or ~~608.1.4.3~~ 608.1.3, rooms containing stationary storage battery systems shall be protected by a ~~continuous~~ gas detection system complying with Section 916. The gas detection system shall be

designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic ~~gases~~ gas exceeds 1/2 of the ~~permissible exposure limits (PEL)~~IDLH.

608.6.1 Lead acid storage batteries. Stationary battery systems utilizing lead acid storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for VRLA storage batteries in accordance with Section 608.4.7.
4. ~~In addition to the signage required in Section 608.2.6, the text in Figure 608.6.1 shall be provided.~~
4. The signage in Section 608.2.6 shall also indicate the room contains Lead Acid batteries.

~~**FIGURE 608.6.1**~~
~~**LEAD ACID STORAGE BATTERY SIGNAGE**~~



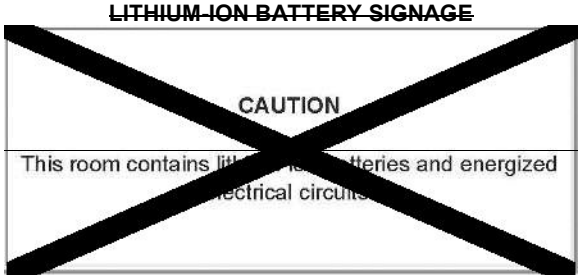
608.6.2 Nickel cadmium (Ni-Cd) storage batteries. Stationary battery systems utilizing nickel cadmium (Ni-Cd) storage batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. Thermal runaway protection shall be provided for valve regulated sealed nickel cadmium storage batteries in accordance with Section 608.4.7.
4. ~~In addition to the signage required in Section 608.2.6, the text in Figure 608.6.2 shall be provided.~~
4. The signage in Section 608.2.6 shall also indicate the room contains nickel cadmium batteries.

~~**FIGURE 608.6.2**~~
~~**NICKEL CADMIUM (NI-CD) BATTERY SIGNAGE**~~

608.6.3 Lithium-ion storage batteries. ~~Stationary battery systems utilizing lithium-ion storage~~ The signage in Section 608.2.6 shall also indicate the type of lithium batteries ~~shall provide signage~~ contained in ~~accordance with Section 608.2. and~~ the ~~text in Figure 608.6.3~~room.

~~**FIGURE 608.6.3**~~
~~**LITHIUM-ION BATTERY SIGNAGE**~~



608.6.4 Sodium beta storage batteries. Stationary battery systems utilizing sodium beta storage batteries shall comply with the following:

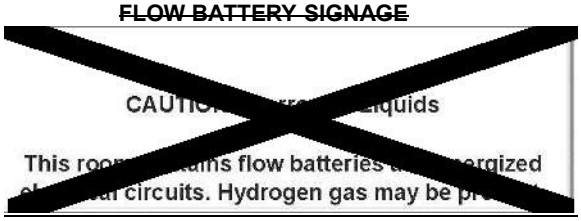
1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. ~~In addition to the signage required in Section 608.2.6, the text in Figure 608.6.4 shall be provided.~~
2. The signage in Section 608.2.6 shall also indicate the type of sodium batteries in the room and APPLY NO WATER.

~~FIGURE 608.6.4~~
~~SODIUM BETA BATTERY SIGNAGE~~

608.6.5 Flow ~~storage~~ batteries. Stationary battery systems utilizing flow ~~storage~~ batteries shall comply with the following:

1. ~~Mechanical ventilation~~ Ventilation shall be provided in accordance with Section 608.5.3.
2. Spill control and neutralization shall be in accordance with Section 608.5.5.
3. ~~In addition to the signage required in Section 608.2.6, the following text in Figure 608.6.5 shall be provided:~~
3. The signage required in Section 608.2.6 shall also indicate the type of flow batteries in the room.

~~608.6.5~~
~~FLOW BATTERY SIGNAGE~~



608.6.6 Other battery technologies. Stationary battery systems utilizing battery technologies other than those described in Sections 608.6.1 through 608.6.5 shall comply with the following:

1. ~~Continuous flammable gas~~ Gas detection systems complying with Section 916 shall be provided in accordance with Section 608.5.4 where the batteries have the potential to produce toxic or highly toxic ~~gases~~ 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 608.5.3.
3. Spill control and neutralization shall be in accordance with Section 608.5.5.
4. In addition to the signage required in Section 608.2.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate the room contains energized electrical circuits.

Commenter's Reason: The F95 proposal, as modified, introduced a complete rewrite of this section that addressed hazards associated with new battery technologies and applications. This public comment enhances the proposal as follows:
608.2.3 - Exceptions 2 and 3 w ere not addressed properly with floor modifications at the Louisville hearings. The intent was to allow Listed pre-engineered and prepackaged battery systems to be a maximum of 250 KWh, not just pre-engineered lithium ion battery systems.

608.2.6 – Two changes to this section, as follows:

1. Deletes the requirement for a battery room signage to include AUTHORIZED PERSONNEL ONLY markings. This was not required in previous editions of the IFC, and isn't really necessary since access to battery rooms is not typically provided for the general public.
2. Deletes the requirements for the NFPA 704 diamond to be provided on battery rooms doors. This is being done because (a) the current signage requirements in this section, and the battery specific signage in Section 608.6 provide sufficient guidance for staff and emergency responders, and (b) because batteries such as lithium ion do not typically have the NFPA 704 criteria included on their MSDS.

608.4.8 - Editorial.
608.5.3, 608.5.3.1 – Editorial, Section 608.1.4.3 doesn't exist, the correct reference is 608.1.3.

608.5.4, 608.6.6 – The changes are provided to correlate with Proposal F75, a complete rewrite of the IFC gas detection system requirements, which was approved as submitted by the committee.
608.6, several sections –These changes remove the figures showing signage, since it may create confusion with the Section 608.2.6 signage, and might prompt users to require two signs on battery room doors. It also revised battery specific wording to remove text that was already covered in Section 608.2.6 and text that was not felt to be critical for staff and emergency responders.
608.6.4 – Editorial change and includes APPLY NO WATER for the sodium water reactive battery types.
608.6.5 – Editorial change from 'flow storage battery' to 'flow battery'.

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

Final Action Results

F95-16 **AMPC2**

F95-16

[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.

15. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined at Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

Code Change No: F111-16

Original Proposal

Section(s): 105.7.9 (New), 202 (New), 602.1, 612 (New), Chapter 80

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

Add new text as follows:

105.7.9 Fuel cell power systems. A construction permit is required to install *stationary fuel cell power systems*.

Add new definition as follows:

FUEL CELL POWER SYSTEM, STATIONARY. A stationary energy generation system that converts the chemical energy of a fuel and oxidant to electric energy (DC or AC electricity) by an electrochemical process.

Field fabricated fuel cell power system. A *stationary fuel cell power system* that is assembled at the job site and is not a pre-engineered or prepackaged factory assembled fuel cell power system.
Pre-engineered fuel cell power system. A *stationary fuel cell power system* consisting of components and modules that are produced in a factory, and shipped to the job site for assembly.
Prepackaged fuel cell power system. A *stationary fuel cell power system* that is factory assembled as a single, complete unit and shipped as a complete unit for installation at the job site.

Revise as follows:

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

BATTERY SYSTEM, STATIONARY LEAD-ACID.
BATTERY TYPES.
COMMERCIAL COOKING APPLIANCES.
CRITICAL CIRCUIT.
EMERGENCY POWER SYSTEM.
FUEL CELL POWER SYSTEM, STATIONARY.
FIELD FABRICATED FUEL CELL POWER SYSTEM.
PRE-ENGINEERED FUEL CELL POWER SYSTEM.
PREPACKAGED FUEL CELL POWER SYSTEM.
~~**EMERGENCY POWER SYSTEM HOOD.**~~
~~**HOOD**~~**Type I.**
Type ~~I~~II.
Type II ~~REFRIGERANT~~.
~~**REFRIGERANT**~~ **REFRIGERATION SYSTEM.**
~~**REFRIGERATION**~~ **STANDBY POWER SYSTEM.**
~~**STANDBY POWER SYSTEM.**~~

Add new text as follows:

SECTION 612
TATIONARY FUEL CELL POWER SYSTEMS

612.1 General. *Stationary fuel cell power systems* in new and existing occupancies shall comply with this section.

612.2 Permits. Permits shall be obtained for *stationary fuel cell power systems* as set forth in Sections 105.7.9.

612.3 Equipment. *Stationary fuel cell power systems* shall comply with the following:

1. *Prepackaged fuel cell power systems* shall be listed and labeled in accordance with CSA FC 1.
2. The modules and components in a *pre-engineered fuel cell power system* shall be listed and labeled in accordance with CSA FC 1 and interconnected to complete the assembly of the system at the job site in accordance with the manufacturer's instructions and their listings.
3. *Field fabricated fuel cell power systems* shall be approved based on a review of the technical report provided in accordance with Section 104.7.2. The report shall be prepared by, and bear the stamp of a registered design professional and shall include:
   3.1. A fire risk evaluation.
   3.2. An evaluation demonstrating that modules and components in the fuel cell power system comply with applicable requirements in CSA FC 1.
   3.3. Documentation of the fuel cell power system's compliance with applicable NFPA 2 and NFPA 853 construction requirements.

612.4 Installation. *Stationary fuel cell power systems* shall be installed and maintained in accordance with NFPA 70 and NFPA 853, the manufacturer's installation instructions, and the listing. *Stationary fuel cell power systems* fueled by hydrogen shall be installed and maintained in accordance with NFPA 2 and NFPA 70, the manufacturer's installation instructions, and the listing.

612.5 Residential use. *Stationary fuel cell power systems* shall not be installed in Group R-3 and R-4 buildings, or dwelling units associated with Group R-2 buildings unless they are specifically listed for residential use.

612.6 Indoor installations. *Stationary fuel cell power systems* installed in indoor locations shall comply with this section. For purposes of this section an indoor location includes a roof and 50 percent or greater enclosing walls .

612.6.1 Listed. The *stationary fuel cell power systems* installed indoors shall be specifically listed and labeled for indoor use.

612.6.2 Separation. Where *stationary fuel cell power systems* are installed indoors the indoor area in which the system is located shall be treated as an incidental use area and be separated from Group B, F, M, S and U occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction. Separation shall be provided in accordance with Section 509 of the *International Building Code*.

> **Exception:** *Stationary fuel cell power systems* with an aggregate rating less than 50 Kw shall not be required to be separated from other occupancies provided the systems comply with NFPA 853, Section 9.3 requirements.

612.6.2.1 Group F, S and U occupancies. Stationary fuel cell power systems located outside of an incidental use area within Group F, S and U occupancies shall be separated from other F, S and U occupancies and Group B and M occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction.

612.6.2.2 Group A, B, E, I, M or R occupancies. Stationary fuel cell power systems shall not be located in Group A, B, E, I, M or R occupancies unless treated as an incidental use as required in Section 612.6.2.

612.7 Vehicle impact protection. Where *stationary fuel cell power systems* are subject to impact by a motor vehicle, vehicle impact protection shall be provided in accordance with Section 312.

612.8 Separation. *Stationary fuel cell power systems* located outdoors shall be separated by not less than five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Any portion of a designated means of egress system
8. Other exposure hazards

612.9 Fuel supply. The design, location and installation of the fuel supply for *stationary fuel cell power systems* shall comply with Chapter 53, Chapter 58 and the *International Fuel Gas Code* based on the particular fuel being supplied to the system.

612.10 Manual shutoff. An accessible manual shutoff valve shall be provided for the fuel piping within 6 feet (1.8m) of any fuel storage tank serving the fuel cell and within 6 feet (1.8 m) of the power system. If the fuel tank and the *stationary fuel cell power system* are less than 12 feet (3.6 m) apart, a single shutoff valve shall be permitted. If the stationary fuel cell power system is located indoors the shutoff valve shall be located outside of the room in which the system is installed, unless otherwise approved by the code official.

612.11 Ventilation and exhaust. Ventilation and exhaust for fuel cell systems shall be provided in accordance with NFPA 853.

612.12 Fire suppression Fire suppression for fuel cell power system installations shall be provided in accordance with NFPA 853.

612.13 Gas detection systems. Fuel cell power systems shall be provided with a gas detection system. Detection shall be provided in approved locations in the fuel cell power system enclosure, the exhaust system, or the room that encloses the fuel cell power system. The system shall be designed to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).

612.13.1 System activation. The activation of the gas detection system shall automatically:

1. Close valves between the gas supply and the fuel cell power system.
2. Shut down the fuel cell power system.
3. Initiate local audible and visible alarms in approved locations.

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

CSA AMERICA INC. 8501 East Pleasant Valley Road Cleveland, Ohio 44131
CSA FC 1 – 2012 Stationary Fuel Cell Power Systems
NFPA Standard
853 – 15 Installation of Stationary Fuel Cell Power Systems

Reason: Fuel cell power systems are being used in ever increasing numbers to meet facility energy needs. Stationary fuel cell power systems generate power through an electrochemical process that combines hydrogen and oxygen to produce electricity. The hydrogen comes from a direct hydrogen source or from any hydrocarbon fuel such as natural gas, gasoline, diesel, or methanol if the fuel cell power system includes integral reforming. The oxygen comes from air around the fuel cell. A new section is being proposed in the IFC which provides a comprehensive set of requirements to mitigate potential hazards associated with the installation and use of stationary fuel cell power systems.

Three referenced documents form the basis for these requirements:

ANSI/CSA FC 1 standard is used to investigate and list the stationary fuel cells covered by this section. The construction and performance requirements in that standard address a variety of hazards, including mechanical, electrical, thermal, malfunction, erroneous human intervention and environmental.
NFPA 853, the Standard for the Installation of Stationary Fuel Cell Power Systems includes requirements for the design, construction, and installation of stationary fuel cell power systems.
NFPA 2, the Hydrogen Technologies Code covers the production, storage, transfer, and use of hydrogen in all occupancies and on all premises. Chapter 12 of this code includes requirements for the design, construction, and installation of stationary fuel cell power systems which are extracted from NFPA 853.
Comments on portions of the proposal are as follows:

612.3 - Currently three companies have prepackaged stationary fuel cell power systems listed by UL for nonresidential indoor and outdoor use, so it is appropriate to require these products to be listed since it will be difficult if not impossible for fire code officials to verify that the systems comply with NFPA 853.

The listing and installation requirements proposed in this section for prepackaged, pre-engineered and field fabricated stationary fuel cell power systems are consistent with, but not identical to, NFPA 853 requirements.
The criteria for approving field fabricated fuel cell power systems is based on NFPA 853 and criteria that is difficult for the code official to obtain and evaluate during plan review and initial inspection.

612.5 – Systems are listed for both residential and nonresidential use based on requirements in the two referenced documents noted above.

612.6 – Systems are listed for either indoor or outdoor use. The 50% wall limitation is from NFPA 853, Section 3.3.15.2. Occupancy separations are based on the incidental use occupancy separations established for hydrogen fuel rooms and stationary battery systems (see IBC table 509).

Exception 1 that allows systems in industrial type occupancies is consistent with the requirements in NFPA 853, Section 5.3.
Exception 2 that covers systems < 50 Kw is consistent with NFPA 853, Section 9.3.

612.6.3 is based on IBC Section 905.3.1 and will make sure the indoor stationary fuel cell power systems are in locations that can be effectively responded to by the fire department and emergency responders if needed.

612.8 separation requirements are based on, but not identical to, separation requirements in NFPA 853, Section 5.1.1, and are provided in the IFC as a convenience for the code user.

612.10 – Manual shutoff requirements are based on, but not identical to, requirements in NFPA 853, Section 6.4.

612.11 – Ventilation, exhaust, fire suppression and gas detection are important parts of a safe installation and references to NFPA 853 are provided as a convenience to the code user.

612.3 – Gas detection system requirements include detection locations from UL 853 and activation criteria that are consistent with IFC requirements.

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

Cost Impact: Will increase the cost of construction
There are no requirements in the code that specifically regulate these systems. Complying with the proposed requirements will result in increased construction and maintenance expenses.

A review of the standard(s) proposed for inclusion in the code, CSA FC 1 – 2012 Stationary Fuel Cell Power Systems and **NFPA Standard** 853 – 15 Installation of Stationary Fuel Cell Power Systems 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 1, 2016.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee felt the proposal had merit but the separation requirements needed clarification and refinement.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

612.6.2 Separation. ~~Where~~ Rooms containing *stationary fuel cell power systems* ~~are installed indoors the indoor area in which the system is located~~ shall ~~be treated as incidental use area and~~ be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the *International Building Code*.

1. Group B, F, M, S and U occupancies by one-hour fire resistive construction~~, and from~~
2. Group A, E, I and R occupancies by two-hour fire resistive construction. ~~Separation shall be provided in accordance with Section 509 of the *International Building Code*.~~

Exception: *Stationary fuel cell power systems* with an aggregate rating less than 50 Kw shall not be required to be separated from other occupancies provided the systems comply with NFPA 853, Section 9.3 requirements.

~~**612.6.2.1 Group F, S and U occupancies.** Stationary fuel cell power systems located outside of an incidental use area within Group F, S and U occupancies shall be separated from other F, S and U occupancies and Group B and M occupancies by one-hour fire resistive construction, and from Group A, E, I and R occupancies by two-hour fire resistive construction.~~

~~**612.6.2.2 Group A, B, E, I, M or R occupancies.** Stationary fuel cell power systems shall not be located in Group A, B, E, I, M or R occupancies unless treated as an incidental use as required in Section 612.6.2.~~

612.8 ~~Separation~~ Outdoor installation. *No change to text.*

2015 International Building Code

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code*.
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.~~.~~
15. Stationary fuel cell power systems installed in accordance with the *International Fire Code*.

Commenter's Reason: The committee correctly identified that the separation requirements for stationary fuel cell power systems in incidental use areas of buildings was not properly addressed. This public comment fixes this by clarifying the separation criteria in Section 612.6.2, and deleting Sections 612.6.2.1 and 612.6.2.2 which were a little confusing, and were not really needed. The title of Section 612.8 was also revised to clarify that the focus of that section was outdoor installations. Also IBC Section 307.1.1 was

revised to clarify that occupancies that employ fuel cells are not automatically classified as Group H. With these revisions the separation requirements for stationary fuel cell power systems are consistent with NFPA 853, and with the IFC/IBC requirements for stationary storage battery systems.

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

Final Action Results

F111-16 **AMPC1**

F111-16

[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.

15. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined at Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

Code Change No: F112-16

Original Proposal

Section(s): 105.6.14 (New), 105.7.4 (New), 202 (New), 612 (New), 907.2.24 (New) [IBC:[F] 907.2.24(New)], IBC; [F] 307.1.1, Table 509

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

Add new text as follows:

105.6.14 Capacitor energy storage systems. An operational permit is required for the operation of capacitor energy storage systems regulated by Section 612.

105.7.4 Capacitor energy storage systems. A permit is required to install capacitor energy storage systems regulated by Section 612.

Add new definition as follows:

CAPACITOR ENERGY STORAGE SYSTEM. A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls, and associated electrical equipment designed to provide electrical power to a building. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

Pre-engineered capacitor energy storage system. A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

Prepackaged capacitor energy storage system. A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that is factory assembled and then shipped as a complete unit for installation at the job site.

Add new text as follows:

SECTION 612
CAPACITOR ENERGY STORAGE SYSTEMS

612.1 Scope. Capacitor energy storage systems having capacities exceeding 70 KWh (252 Mega joules) shall comply with this section.

612.1.2 Permits. Permits shall be obtained for the installation and operation of capacitor energy storage systems in accordance with Sections 105.6.14 and 105.7.4.

612.1.3 Construction documents. The following information shall be provided with the permit application:

1. Location and layout diagram of the room in which the capacitor energy storage system is to be installed
2. Details on hourly fire-resistant rated assemblies provided
3. Quantities and types of capacitors in the system.
4. Manufacturer's specifications, ratings and listings of capacitors and capacitor energy storage systems

5. Location and content of signage
6. Details on fire suppression, smoke detection and ventilation systems.
7. Rack storage arrangement, including seismic support criteria.

612.1.4 Hazard mitigation analysis. A hazard mitigation analysis, applicable to the capacitors shall be approved and comply with Section 612.1.4.1 and 612.1.4.2 and this section. A failure modes and effects analysis (FMEA) or other approved hazard mitigation analysis shall be provided in accordance with Section 104.7.2 under any of the following conditions:

1. Capacitor technologies not specifically identified in this code are provided.
2. More than one capacitor energy storage system technology is provided in a room or indoor area where there is a potential for adverse interaction between technologies.
3. When allowed as a basis for increasing maximum allowable quantities.

612.1.4.1 Fault condition. The hazard mitigation analysis shall evaluate the consequences of the following failure modes, and others deemed necessary by the fire code official. Only single failure modes shall be considered.

1. Thermal runaway condition in a single capacitor rack, module or array.
2. Failure of any energy management system.
3. Failure of any required ventilation system.
4. Voltage surges on the primary electric supply.
5. Short circuits on the load side of the capacitor energy storage system.
6. Failure of the smoke detection, fire suppression, or gas detection system.
7. Spill neutralization not being provided or failure of the secondary containment system.

612.1.4.2 Analysis approval. The fire code official is authorized to approve the hazardous mitigation analysis provided the consequences of the hazard mitigation analysis demonstrate:

1. Fires or explosions will be contained within unoccupied capacitor energy storage rooms for the minimum duration of the fire resistance rated walls identified in IBC table 509.1.
2. Fires and explosions in cabinets in occupied work centers will be detected in time to allow occupants within the room to safely evacuate.
3. Toxic and highly toxic gases released during fires and other fault conditions shall not reach concentrations in access of IDLH level in the building or adjacent means of egress routes during the time deemed necessary to evacuate from that area.
4. Flammable gases released from batteries during charging, discharging and normal operation shall not exceed 25% of their lower flammability limit (LFL).
5. Flammable gases released from batteries during fire, overcharging and other abnormal conditions shall not create an explosion hazard that will injure occupants or emergency responders.

612.1.5 Seismic and structural design. *Capacitor energy storage systems* shall comply with the seismic design requirements in Chapter 16 of the International Building Code, and shall not exceed the floor loading limitation of the building.

612.1.6 Vehicle impact protection. Where *capacitor energy storage systems* are subject to impact by a motor vehicle, including fork lifts, vehicle impact protection shall be provided in accordance with Section 312.

612.1.7 Combustible storage. Combustible materials not related to the capacitor energy storage system shall not be stored in capacitor rooms.

612.1.8 Testing, maintenance and repairs. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing other types of capacitors

into the *capacitor energy storage system* shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

612.2 Location, construction and signage. The location, construction and signage for capacitor energy storage systems shall be in accordance with Sections 612.2.1 through 612.2.4.

612.2.1 Location and construction. The locatiion and construction of capacitor energy storage systems within buildings shall be in accordance with Sections 612.2.1.1 through 612.2.1.5.1.

612.2.1.1 Location. Capacitor energy storage systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

612.2.1.2 Separation. Rooms containing capacitor energy storage systems shall be separated from other areas of the building in accordance with Section 509.1 of the *International Building Code*. Capacitor energy storage systems shall be allowed to be in the same room with the equipment they support.

612.2.1.3 Capacitor energy storage system arrays. Capacitor energy storage systems shall be segregated into arrays not exceeding 50 KWh (180 Mega joules) each. Each array shall be spaced a minimum three feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

> **Exception:** Listed pre-engineered capacitor energy storage systems and listed prepackaged capacitor energy storage systems shall not exceed 150 KWh (540 Mega joules) each.

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

612.2.1.5 Occupied work areas. Where stationary cacapitors are located in an occupied work center, they shall be housed in a noncombustible cabinet or other enclosure to prevent access by unauthorized personnel.

612.2.2 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to *capacitor energy storage system* rooms and shall include the following or equivalent.

1. A minimum 8 in. (200 mm) wide and 6 in. (150 mm) high sign with:
   a. CAUTION
   b. CAPACITOR ENERGY STORAGE ROOM
   c. THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS, AUTHORIZED PERSONNEL ONLY, and
   d. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.
2. Hazard identification markings in accordance with NFPA 704.

> **Exception:** AUTHORIZED PERSONNEL ONLY markings are not required for entrances to occupied work centers that comply with Section 608 requirements.

612.2.3 Cabinet signage. *Capacitor energy storage systems* located in cabinets provided in occupied work centers in accordance with Section 608.2.5 shall have exterior labels that indicate CAUTION, CAPACITOR ENERGY SYSTEM CABINET, THIS CABINET CONTAINS ENERGIZED ELECTRICAL CIRCUITS, AUTHORIZED PERSONNEL ONLY.

612.2.4 Electrical disconnects. Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the

location of the main service disconnecting means indicating the location of the capacitor energy storage system disconnecting means in accordance with NFPA 70.

612.2.5 Outdoor installations. Capacitor energy storage systems located outdoors shall comply with Sections 612.2.5.1 through 612.2.5.4, in addition to all applicable requirements of Section 612. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor energy storage system rooms.

Exception: Capacitor energy storage arrays in noncombustible containers shall not be required to be spaced feet (914 mm) from the container walls.

612.2.5.1 Separation. Capacitor energy storage systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

612.2.5.2 Means of egress. Capacitor energy storage systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

612.2.5.3 Security of outdoor areas. Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

612.2.5.4 Walk in units. Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

612.3 Maximum allowable quantities. Fire areas within buildings containing *capacitor energy storage systems* that exceed 600 KWh of energy capacity shall comply with all applicable High Hazard Group H occupancy requirements in this code and the *International Building Code*.

Exception: Where approved by the fire code official, areas containing *capacitor energy storage systems* that exceed 600 KWh shall be treated as incidental use areas and not Group H occupancies based on a hazardous mitigation analysis in accordance with Section 612.1.4 and large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory.

612.4 Capacitors and equipment. The design and installation of capacitors, *capacitor energy storage systems*, and related equipment shall comply with this section.

612.2.1.5.1 Cabinets. Where stationary capacitors are contained in cabinets in occupied work centers, the cabinet enclosures shall be located within 10 feet (3048 mm) of the equipment that they support.

612.4.1 Listings. Capacitors and *capacitor energy storage systems* shall comply with the following:

1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

612.4.2 Prepackaged and pre-engineered systems. Prepackaged and pre-engineered *capacitor energy storage systems* shall be installed in accordance with their listing and the manufacturer's instructions.

612.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage (overcharge) or under voltage (over discharge) are detected.

612.4.4 Capacitor chargers. Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged capacitor energy storage system.

612.4.5 Inverters. Inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be permitted to operate in parallel with the electric utility power system to supply power to common loads.

612.4.6 Toxic and highly toxic gas. *Capacitor energy storage systems* that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

612.5 Detection and protection systems. Fire suppression, smoke detection, mechanical ventilation and gas detection shall be provided in rooms containing *capacitor energy storage systems* as required for stationary storage battery systems in accordance with Section 608.5 through 608.5.4.

612.5.1 Fire suppression systems. Rooms containing capacitor energy storage systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific technologies capacitors shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the *fire code official* is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

612.5.1.1 Alternative suppression systems. Capacitor energy systems that utilize water reactive materials shall be protected by an approved alternative automatic fire- extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted or witnessed and reported by an approved laboratory.

612.5.2 Smoke protection system. An approved automatic smoke detection system shall be installed in rooms containing capacitor energy storage systems in accordance with Section 907.2.

612.5.3 Mechnical ventilation. Ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the *International Mechanical Code* and the following:

1. The ventilation system shall operate continuously or be designed to operate upon activation of the gas detection system.
2. The system shall provide ventilation at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m3/(s • m2)] of floor area, but not less than 150 cfm (4 m3/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the vault ceiling for gases having a vapor density less than air.

612.5.3.1 Cabinet ventilation. Cabinets located in occupied spaces containing capacitors shall be provided with mechanical ventilation in accordance with this section.

612.5.3.2 Supervision. Required mechanical ventilation systems for rooms and cabinets containing capacitors shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visual signal at an approved constantly attended on-site location.

612.5.4 Gas detection system. Rooms containing stationary capacitor energy storage systems shall be protected by a continuous gas detection system. The gas detection system shall be designed to activate where the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL), or where the level of toxic or highly toxic gases exceeds the permissible exposure limits (PEL).

612.5.4.1 System activation. Activation of the gas detection system shall result in all the following:

1. Initiation of distinct audible and visible alarms in the capacitor energy storage system room.
2. Transmission of an alarm to an approved location.
3. De-energizing of the capacitor.
4. Activation of the mechanical ventilation system, where the system is interlocked with the gas detection system.

612.6 Spill control and neutralization. *Capacitor energy storage systems* that contain free electrolytes and other hazardous materials shall be provided with spill control and neutralization as required in Section 608.5.5 for stationary storage battery systems.

907.2.24 (IBC [F] 907.2.24) Capacitor energy storage systems. An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 612.

2015 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code.*
10. Capacitor energy storage systems installed in accordance with the *International Fire Code.*
11. Corrosive personal or household products in their original packaging used in retail display.

12. Commonly used corrosive building materials.
13. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
14. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
15. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.

TABLE 509
INCIDENTAL USES

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

ROOM OR AREA	SEPARATION AND/OR PROTECTION
capacity greater than the threshold quantity specified in Section 612.1 of the *International Fire Code*.	Group A, E, I and R occupancies.

For SI: 1 square foot = 0.0929 m^2, 1 pound per square inch (psi) = 6.9 kPa, 1 British thermal unit (Btu) per hour = 0.293 watts, 1 horsepower = 746 watts, 1 gallon = 3.785 L, 1 cubic foot = 0.0283 m^3.

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

UL 1741 - 2015 Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
UL 1973 Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
UL 9540 Standard for Energy Storage Systems and Equipment

Reason: The U.S. Department of Energy is working with a wide range of stakeholders to encourage the development of large scale electrical energy storage systems (ESS). ESS are needed because the amount of electricity that can be generated on the electrical grid is relatively fixed over short periods of time, although demand for electricity fluctuates throughout the day. Developing technology to store electrical energy so it can be available to meet demand is being actively pursued with a number of energy storage technologies, including battery storage systems and electrochemical capacitors, among others.

The upcoming widespread installation of large ESS systems into existing buildings poses significant hazards to occupants and emergency responders due to the nature of the technologies involved and the large amounts energy being stored. These systems are largely unregulated by the IBC and IFC, especially capacitors energy storage systems (CESS) which are just largely under development have the potential to be a significant energy storage source by 2018.

This proposal, which is a companion proposal to the FCAC stationary storage battery system proposal, establishes basic protection requirements for CESS. Without these requirements, these systems will be virtually unregulated by 2018 fire and building codes. This proposal includes safety measures that are similar to the FCAC proposed battery storage system requirements, with some modifications as noted below.

1. Revisions are proposed to IBC Section 307.1.1 and Table 509.1 to allow CESS under the MAQ to be allowed in incidental use areas of buildings, and to not have to comply with hazardous material requirements, which is consistent with current battery storage system requirements. The intent of this proposal is to support the DOE energy storage initiative by allowing significant quantities of capacitors in incidental use areas of buildings, with a reasonable number of protection measures in place to protect occupants and emergency responders in the event of a fire or other incident originating from, or impinging on the CESS.
2. Construction and operational permits are required for CESS systems above the threshold amounts in Section 612.1.
3. The protection concepts in Sections 612.1.1 though 612.2.4 are based FCAC proposed battery storage system requirements.
4. Section 612.3 includes a MAQ of 600 KWh for all capacitor technologies. Installations in excess of this amount cannot be located in incidental use areas of buildings and must be located in Group H occupancies.
5. Sections 612.4 to 612.6 are based on FCAC proposed battery storage system requirements.

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

Cost Impact: Will increase the cost of construction
This proposal introduces a number of new requirements for capacitor energy storage system installations that were previously unregulated.

Analysis: A review of the standard(s) proposed for inclusion in the code,

- **UL 1741 - 2015** Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
- **UL 1973** Standard for Batteries for Use in Light Electric Rail (LER) Applications and Stationary Applications
- **UL 9540** Standard for Energy Storage Systems and Equipment

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 1, 2016.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee was in favor of the concept presented by this proposal however the proposal needs more refinement regarding a variety of issues such as the separation requirements.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Replace proposal as follows:

105.7.4 Capacitor energy storage systems. A permit is required to install capacitor energy storage systems regulated by Section 612.

CAPACITOR ENERGY STORAGE SYSTEM. A stationary, rechargeable energy storage system consisting of capacitors, chargers, controls, and associated electrical equipment designed to provide electrical power to a building or facility. The system is typically used to provide standby or emergency power, an uninterruptable power supply, load shedding, load sharing or similar capabilities.

Pre-engineered capacitor energy storage system. A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that are produced in a factory, designed to comprise the system when assembled and shipped to the job site for assembly.

Prepackaged capacitor energy storage system. A capacitor energy storage system consisting of capacitors, an energy management system, components and modules that is factory assembled and then shipped as a complete unit for installation at the job site.

CAPACITOR ARRAY. An arrangement of individual capacitor modules in close proximity to each other, mounted on storage racks or in cabinets or other enclosures.

SECTION 612
CAPACITOR ENERGY STORAGE SYSTEMS

612.1 Scope. Capacitor energy storage systems having capacities exceeding 3 KWh (10.8 Mega joules) shall comply with this section.

Exception: Capacitors regulated by NFPA 70, Chapter 460 and capacitors included as a component part of other listed electrical equipment are not required to comply with this section.

612.1.1 Permits. Permits shall be obtained for the installation of capacitor energy storage systems in accordance with Section 105.7.4.

612.2 Location and construction. Rooms and areas containing capacitor energy storage systems shall be designed, located and constructed in accordance with this section.

612.2.1 Location. Capacitor energy storage systems shall not be located in areas where the floor is located more than 75 feet (22 860 mm) above the lowest level of fire department vehicle access, or where the floor level is more than 30 feet (9144 mm) below the finished floor of the lowest level of exit discharge.

612.2.2 Separation. Rooms containing capacitor energy storage systems shall be separated from the following occupancies by fire barriers or horizontal assemblies, or both, constructed in accordance with the *International Building Code*.

1. Group B, F, M, S and U occupancies by one-hour fire resistive construction,
2. Group A, E, I and R occupancies by two-hour fire resistive construction.

612.2.3 Capacitor arrays. Capacitor energy storage systems shall be segregated into arrays not exceeding 50 KWh (180 Mega joules) each. Each array shall be spaced a minimum three feet (914 mm) from other arrays and from walls in the storage room or area. The storage arrangements shall comply with Chapter 10.

Exception: Capacitor energy storage systems in noncombustible containers located outdoors shall not be required to be spaced three feet (914 mm) from the container walls.

612.2.4 Signage. Approved signs shall be provided on doors or in locations adjacent to the entrances to capacitor energy storage system rooms and shall include the following or equivalent.

1. CAPACITOR ENERGY STORAGE ROOM
2. THIS ROOM CONTAINS ENERGIZED ELECTRICAL CIRCUITS
3. An identification of the type of capacitors present and the potential hazards associated with the capacitor type.

612.2.5 Electrical disconnects. Where the capacitor energy storage system disconnecting means is not within sight of the main service disconnecting means, placards or directories shall be installed at the location of the main service disconnecting means identifying the location of the capacitor energy storage system disconnecting means in accordance with NFPA 70.

612.2.6 Outdoor installations, Capacitor energy systems located outdoors shall comply with this Section, in addition to all applicable requirements of Section 608. Installations in outdoor enclosures or containers which can be occupied for servicing, testing, maintenance and other functions shall be treated as capacitor storage rooms.

Exception: Capacitor arrays in noncombustible containers shall not be required to be spaced three feet (914 mm) from the container walls.

612.2.6.1 Separation. Capacitor energy systems located outdoors shall be separated by a minimum five feet (1524 mm) from the following:

1. Lot lines
2. Public ways
3. Buildings
4. Stored combustible materials
5. Hazardous materials
6. High-piled stock
7. Other exposure hazards

Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.

612.2.6.2 Means of egress. Capacitor energy storage systems located outdoors shall be separated from any means of egress as required by the fire code official to ensure safe egress under fire conditions, but in no case less than 10 feet (3048 mm).

Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress.

612.2.6.3 Security of outdoor areas. Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.

612.2.6.4 Walk-in units. Where a capacitor energy storage system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.

612.3 Maximum allowable quantities. Fire areas within buildings containing capacitor energy storage systems that exceed 600 KWh of energy capacity shall comply with all applicable High Hazard Group H occupancy requirements in this Code and the *International Building Code*.

612.4 Capacitors and equipment. The design and installation of capacitor energy storage systems, and related equipment shall comply with this section.

612.4.1 Listing. Capacitors and capacitor energy storage systems shall comply with the following:

1. Capacitors shall be listed in accordance with UL 1973.
2. Prepackaged and pre-engineered stationary capacitor energy storage systems shall be listed in accordance with UL 9540.

612.4.2 Prepackaged and pre-engineered systems. In addition to other applicable requirements of this code, prepackaged and pre-engineered capacitor energy storage systems shall be installed in accordance with their listing and the manufacturer's instructions.

612.4.3 Energy management system. An approved energy management system shall be provided for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. The system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, overvoltage or under voltage are detected.

612.4.4 Capacitor chargers. Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with the UL 1564 or provided as part of a listed pre-engineered or prepackaged capacitor energy storage system.

612.4.5 Toxic and highly toxic gas. Capacitor energy storage systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.

612.5 Detection and protection systems. Fire suppression and smoke detection systems shall be provided in capacitor energy storage system rooms in accordance with this section.

612.5.1 Fire suppression systems. Rooms containing capacitor energy storage systems shall be equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1. Commodity classifications for specific capacitor technologies shall be in accordance with Chapter 5 of NFPA 13. If the capacitor types are not addressed in Chapter 5 of NFPA 13, the fire code official is authorized to approve the fire suppression system based on full scale fire and fault condition testing conducted by an approved laboratory.

612.5.1.1 Alternative suppression systems. Capacitor energy storage systems that utilize water reactive materials shall be protected by an approved alternative automatic fire- extinguishing system in accordance with Section 904. The system shall be listed for protecting the type, arrangement and quantities of capacitors in the room. The fire code official shall be permitted to approve the alternate fire suppression system based on full scale fire and fault condition testing conducted by an approved laboratory.

612.5.2 Smoke detection system. An approved automatic smoke detection system shall be installed in rooms containing capacitor energy storage systems in accordance with Section 907.2.

612.5.3 Ventilation. Where capacitors release flammable gases during normal operating conditions ventilation of rooms containing capacitor energy storage systems shall be provided in accordance with the International Mechanical Code and the following:

1. The ventilation system shall be designed to limit the maximum concentration of flammable gas to 25% of the lower flammability limit, or
2. Continuous ventilation shall be provided at a rate of not less than 1 cubic foot per minute (cfm) per square foot [0.00508 m3/(s • m2)] of floor area, but not less than 150 cfm (4 m3/min).
3. The exhaust system shall be designed to provide air movement across all parts of the floor for gases having a vapor density greater than air and across all parts of the ceiling for gases having a vapor density less than air.

612.5.3.1 Supervision. Required mechanical ventilation systems for rooms containing capacitor energy storage systems shall be supervised by an approved central station, proprietary or remote station service or shall initiate an audible and visible signal at an approved constantly attended on-site location.

612.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries as follows:

For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0.
For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.

612.6 Testing, maintenance and repairs. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing different capacitors technologies into the capacitor energy storage system shall be treated as a new installation and require approval by the fire code official before the replacements are introduced into service.

907.2.24 Capacitor energy storage systems. An automatic smoke detection system shall be installed in areas containing capacitor energy storage systems as required by Section 612.

2015 International Building Code

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.

4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code.*
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Capacitor energy storage systems in accordance with the *International Fire Code*.

Commenter's Reason: At the Code Action Hearing we advised the committee that the proposal needed some additional work to properly address this new energy storage system technology. Per the committee reason statement they were in favor of the concept presented by this proposal but also recognized that the proposal needed needs more refinement regarding a variety of issues such as the separation requirements.

In this public comment we addressed the concerns with this proposal by retaining the basic protection concept used for other energy storage systems in this code, while eliminating unnecessary requirements which included, among other things, the operational permit (dropped in all ESS system proposals), construction documents, hazard mitigation analysis and acceptance criteria, and occupied work area criteria.

In addition to these changes the threshold quantity in Section 612.1 was reduced to 3 KWh in recognition of the potential severity of a fire event involving current capacitor technologies, which often contain highly flammable Acetonitrile compounds.

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

Final Action Results

F112-16 **AMPC1**

F112-16

[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.

15. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined at Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

Code Change No: F130-16

Original Proposal

Section: 806, 806.2, 806.3, 806.4, 806.5, 807, 807.1, 807.5 (New), 807.5.1 (New), 807.5.2 (New), 807.5 (IBC [F] 806.1)

Proponent: Marcelo Hirschler, representing GBH International (gbhint@aol.com); Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com)

Revise as follows:

SECTION 806
NATURAL DECORATIVE VEGETATION IN NEW AND EXISTING BUILDINGS

Delete without substitution:

~~**806.2 Artificial vegetation.** Artificial decorative vegetation shall meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701. Meeting the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 shall be documented and certified by the manufacturer in an *approved* manner. Alternatively, the artificial decorative vegetation item 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.~~

Revise as follows:

~~**806.3**~~ **806.2 Obstruction of means of egress.** *No change to text.*

~~**806.4**~~ **806.3 Open flame.** *No change to text.*

~~**806.5**~~ **806.4 Electrical fixtures and wiring.** The use of unlisted electrical wiring and lighting on natural vegetation, including natural cut trees ~~and artificial decorative vegetation,~~ shall be prohibited. ~~The use of electrical wiring and lighting on artificial trees constructed entirely of metal shall be prohibited.~~

SECTION 807
DECORATIVE MATERIALS OTHER THAN NATURAL DECORATIVE VEGETATION IN NEW AND EXISTING BUILDINGS

807.1 General. Combustible decorative materials, ~~other than~~ including artificial decorative vegetation, shall comply with Sections 807.2 through ~~807.5.6~~ 807.6. Natural decorative vegetation shall comply with Section 806.

Add new text as follows:

807.5 Artificial Decorative Vegetation Artificial decorative vegetation shall comply with this section as well as with the requirements of Sections 806.2 and 806.3.

807.5.1 Flammability Artificial decorative vegetation shall meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701. Meeting the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 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.

807.5.2 Electrical Fixtures and Wiring on Artificial Vegetation 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.

Revise as follows:

807.~~5~~ 807.6 Occupancy-based requirements. In occupancies specified, combustible decorative materials not complying with Section 807.3 shall comply with Sections ~~807.5.1~~ 807.6.1 through ~~807.5.6~~ 807.6.6.

Reason: This proposal moves all of the requirements for artificial decorative vegetation into the section on decorative materials. In that way the limitations in section 807.2 through 807.4 will apply to them as well. It has been claimed that there is often interest in displaying seasonal decorative items like a wreath and that it is not always possible to determine compliance of these items with NFPA 701 or NFPA 289. However, large artificial vegetation items that do not comply with either of the fire tests have been shown to generate massive amounts of heat when they burn. Therefore, this proposal would allow the fire code official to handle these items like any other combustible decorative material within the limitations of section 807.

This proposal creates a new section 807.5 dealing with artificial decorative vegetation within 807, which is the section on all decorative materials. The existing section 806.2 is moved to 807.5.1 and the requirements dealing with lighting and electrical are split so that section 806 contains only those dealing with natural vegetation and the new section 807.5.2 contains those dealing with artificial vegetation.

All existing section 807.5, dealing with specific occupancies, is being moved to become section 807.6, without change.

Cost Impact: Will not increase the cost of construction
Reorganizes the section to include artificial decorative vegetation with all other decorative materials.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F130-16 **AS**

Code Change No: F134-16

Original Proposal

Section(s): 807.1 (IBC [F] 806.1)

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

Revise as follows:

807.1 General. ~~Combustible~~ In Groups A, E, I and R-1, and dormitories in Group R-2, combustible decorative materials, other than decorative vegetation, shall comply with Sections 807.2 through 807.5.6.

Reason: When F109-13 was submitted, the reason stated that it was only a clarification. But in fact, the requirements for combustible decorative materials which previously had only applied to A, E, I, R-1 and dormitories in R-2 suddenly applied to all occupancies. It appears that change was done unintentionally, so this proposal intends to correct that situation.

There is no significant reason to begin regulating drapes and curtains in Group F, S or U occupancies.

Additionally, there are no specific occupancy limitations noted in Sections 807 and 808 for Groups F, S and U. So this proposal is consistent with the remainder of the provisions.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls,

Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC (http://www.iccsafe.org/codes-tech-support/cs/fire-code-action-committee-fcac/)

Cost Impact: Will not increase the cost of construction
This proposal will not increase the cost of construction. In fact, it will reduce the cost of construction in those occupancies ich do not need to comply.
ich do not need to comply.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee stated that the description of the occupancies and the criteria for their inclusion needed improvement.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Replace proposal as follows:

~~**807.1 General.** Combustible decorative materials, other than decorative vegetation, shall comply with Sections 807.2 through 807.5.6.~~

~~**807.2**~~ **807.1** ~~**Limitations**~~ **General.** The following requirements shall apply to all occupancies:

1. Furnishings or decorative materials of an explosive or highly flammable character shall not be used.

2. Fire-retardant coatings in existing buildings shall be maintained so as to retain the effectiveness of the treatment under service conditions encountered in actual use.
3. Furnishings or other objects shall not be placed to obstruct exits, access thereto, egress therefrom or visibility thereof.
4. The permissible amount of decorative vegetation and noncombustible decorative materials shall not be limited.

~~807.3~~ 807.2 Combustible decorative materials. In ~~other than~~ Groups A, B, E, I, M and R-1 and in dormitories in Group ~~I-3~~ R-2, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall comply with Section 807.4 and shall not exceed 10 percent of the specific wall or ceiling area to which they are attached.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered *interior finish*, shall comply with Section 803 and shall not be considered *decorative materials* or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and other similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.13 of the *International Building Code*.
2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and other similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
3. In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.4 and shall not be limited.

~~807.5~~ 807.4 Occupancy-based requirements. ~~In occupancies specified, combustible decorative materials not complying with Section 807.3~~ Occupancies shall comply with Sections 807.5.1 through 807.5.6.

Commenter's Reason:

1. Section 807.1 is unneeded. All of the subsections of Section 807 are self-contained, and in addition, the text is incorrect in stating that combustible decorative materials are required to comply with the following provisions. It's actually the occupancies containing the materials that are regulated with respect to the decorative materials that are or aren't permitted. It appears that the proponents of this text, added to the 2015 edition by Code Change F109-13, were trying to use this section to exempt decorative vegetation. That being the case, this allowance has been moved to the new Section 807.1, previously 807.2, in Item 4.
2. The revision to Section 807.3 reinstates a list of occupancy classifications that previously applied in the 2012 code and were deleted from the text in 2015 by Code Change F109-13 without reason or justification. As modified by this comment, the provisions get much closer to what was required by the 2012 code, as they should be. There is simply no justification for these requirements to apply to factories, storage occupancies and other uses that the requirements didn't apply to before the 2015 edition.
3. Section 807.5 has been revised because the allowance to exempt occupancies listed in this section from their applicable special regulations based on complying with Section 807.3 (general decorative material restrictions) is potentially dangerous. For example,. restrictions on the use of foam plastics in Group A are currently waived if you comply with Section 807.3. How this was overlooked in the rewrite of this section is amazing, but it needs to be fixed to close a huge hole in the code.

Final Action Results

F134-16 **AMPC1**

Code Change No: F135-16

Original Proposal

Section: 807.3 (IBC: [F] 806.3)

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

Revise as follows:

807.3 Combustible decorative materials. In other than Group I-3, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall comply with Section 807.4 and shall not exceed 10 percent of the specific wall or ceiling area to which they are attached. In Group I-3 combustible decorative materials are prohibited.

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered *interior finish*, shall comply with Section 803 and shall not be considered *decorative materials* or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and other similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.13 of the *International Building Code*.
2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and other similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
3. In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.4 and shall not be limited.
4. In other than Group I-3, curtains, draperies, fabric hangings and similar combustible decorative materials used as window coverings.

Reason: The first change would reinstate the prohibition against the use of combustible materials in Group I-3 occupancies. The second change would remove any limitations on window coverings. Virtually every hotel room in the world has a window; in fact natural light in hotel rooms is a requirement under section 1205 of the code. Some hotel rooms use glazing for the entire exterior wall. Without this proposal typical hotel room drapes at required windows could not be used. This proposal intends to solve any interpretation issues that may occur with window coverings.

Cost Impact: Will not increase the cost of construction
The proposal will provide clarity for Group I-3 occupancies and more flexibility for window coverings, therefore there are no cost impacts associated with this proposal.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

807.3 Combustible decorative materials. In other than Group I-3, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceilings shall comply with Section 807.4 and shall not exceed 10 percent of the specific wall or ceiling area to which they are attached. ~~In Group I-3 combustible decorative materials are prohibited.~~

Fixed or movable walls and partitions, paneling, wall pads and crash pads applied structurally or for decoration, acoustical correction, surface insulation or other purposes shall be considered *interior finish*, shall comply with Section 803 and shall not be considered *decorative materials* or furnishings.

Exceptions:

1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and other similar combustible decorative material suspended from walls or ceilings shall not exceed 75 percent of the aggregate wall area where the building is equipped throughout with an *approved automatic sprinkler system* in accordance with Section 903.3.1.1, and where the material is installed in accordance with Section 803.13 of the *International Building Code*.
2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and other similar decorative materials suspended from walls or ceilings shall not exceed 50 percent of the aggregate wall areas where the building is equipped throughout with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.
3. In Group B and M occupancies, the amount of combustible fabric partitions suspended from the ceiling and not supported by the floor shall comply with Section 807.4 and shall not be limited.
4. ~~In other than Group I-3,~~ The 10 percent limit shall not apply to curtains, draperies, fabric hangings and similar combustible decorative materials used as window coverings.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it corrected the prohibition for Group I-3 occupancies that was missed in the original proposal and it also clarifies where the 10 percent limit does not apply.

Assembly Action **None**

Final Action Results

F135-16 **AM**

Code Change No: F141-16

Original Proposal

Section: 901.4.6, 903.3, 903.3.6 (IBC [F] 903.3.6) (New), 903.3.6.1 (IBC [F] 903.3.6.1) (New), 903.3.6.2 (IBC [F] 903.3.6.2) (New), 903.3.6.3 (IBC [F] 903.3.6.3) (New), 903.3.6.4 (IBC [F] 903.3.6.4) (New), 903.3.6.5 (IBC [F] 903.3.6.5) (New), 903.3.6.6 (IBC [F] 903.3.6.6) (New), 903.3.6.7 (IBC [F] 903.3.6.7) (New)

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

Revise as follows:

901.4.6 Pump ~~and riser~~ room size. Where provided, fire pump ~~rooms and automatic sprinkler system riser~~ rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump ~~and automatic sprinkler system riser~~ rooms shall be provided with ~~a door(s)~~ doors and an unobstructed passageway large enough to allow removal of the largest piece of equipment.

903.3 Installation requirements. *Automatic sprinkler systems* shall be designed and installed in accordance with Sections 903.3.1 through ~~903.3.8~~ 903.3.9.

Add new text as follows:

903.3.6 (IBC [F] 903.3.6) Fire sprinkler riser rooms. Where the main water control valve for automatic sprinkler systems designed in accordance with Section 903.3.1.1 is installed on the riser, the riser shall be located in a fire sprinkler riser room. Fire sprinkler riser rooms shall only contain automatic sprinkler system risers and appurtenances, fire alarm equipment and devices and fire pump equipment.

Exceptions:

1. A fire sprinkler riser room is not required for automatic sprinkler systems controlled by wall-mounted post indicator valves operable from the exterior of the building.
2. In multi-story facilities, floor control valves are permitted to be located on each floor level in an exit stairway enclosure.

903.3.6.1 (IBC [F] 903.3.6.1) Size. Fire sprinkler riser rooms containing one fire sprinkler riser shall have a minimum area of 16 square feet (1.49 m2), with a minimum dimension of 4 feet (102 mm).

903.3.6.2 (IBC [F] 903.3.6.2) Working space. A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided in front of each riser.

903.3.6.3 (IBC [F] 903.3.6.3) Exterior Access Door. Fire sprinkler riser rooms shall have an exterior access door with a minimum clear width of 32 inches (813 mm) and a minimum height of 80 inches (2032 mm).

903.3.6.4 (IBC [F] 903.3.6.4) Marking on access doors. Exterior access doors for fire sprinkler riser rooms shall be labeled on the exterior side with the following sign or other approved sign:

FIRE SPRINKLER RISER ROOM
The lettering shall be in a contrasting color to the background. Letters shall have a minimum height of 2-inches (51 mm) with a minimum stroke of 3/8-inch (10 mm).

903.3.6.5 (IBC [F] 903.3.6.5) Equipment access. Fire sprinkler riser rooms shall be provided with doors and an unobstructed accessway large enough to allow removal of the largest piece of equipment.

903.3.6.6 (IBC [F] 903.3.6.6) Environment. Fire sprinkler riser rooms shall be maintained at a minimum temperature of 40ºF (4ºC) and a maximum temperature of 100ºF (38ºC). Heating and cooling units for the fire sprinkler riser room shall be permanently installed.

> **Exception:** The maximum temperature requirement does not apply to fire sprinkler riser rooms that do not contain a fire alarm control unit or spare sprinkler heads.

903.3.6.7 (IBC [F] 903.3.6.7) Lighting. Permanently installed artificial illumination shall be provided in the fire sprinkler riser room.

Reason: This proposal provides a minimum level of protection and location for fire sprinkler risers. A fire sprinkler riser room is only required where a system is designed under NFPA 13 and the main control valve is on the riser. Other installations with wall-mounted PIVs or yard PIVs would not require a riser room since the only equipment on that portion of the riser would typically be just a flow switch.

Placing the fire riser within a riser room creates a layer of protection for the riser and any other fire protection equipment which may be in riser room. The exterior door provides easy access for firefighting operations, inspection and testing requirements, and maintenance on the system.

The minimum size and the lighting requirements insure the room will be large enough and well lit for proper maintenance and testing. The minimum temperature requirement of the room provides protection from freezing for the sprinkler system and fire pump, if collocated in the room, as required by NFPA 13 and 20. The maximum temperature protects spare sprinkler heads from temperatures above their listings and fire alarm control units, if collocated it the room, as required by NFPA 13 and 72.

A fire sprinkler riser room provides the following benefits:

- Quick, easy access to the fire sprinkler risers by fire fighters during a fire event.
- Provides a secure location away malicious mischief and vandalism.
- Provides protection from any potential vehicular traffic where the riser may otherwise be located in a parking lot.
- Protects the valves and appurtenances from weathering, reducing long term maintenance costs.
- Results in a more dependable system for the life of the building

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

Cost Impact: Will increase the cost of construction
This proposal will result in a minimal increase to the cost of construction to provide a riser room of 16 square feet.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

901.4.6 Pump and riser room size. Where provided, fire pump rooms and *automatic sprinkler system* riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working space around the stationary equipment. Clearances around equipment to elements of permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing

such elements of permanent construction or disabling the function of a required fire-resistance-rated assembly. Fire pump and *automatic sprinkler system* riser rooms shall be provided with doors and an unobstructed passageway large enough to allow removal of the largest piece of equipment.

903.3 Installation requirements. *Automatic sprinkler systems* shall be designed and installed in accordance with Sections 903.3.1 through ~~903.3.9~~ 903.3.8.

~~**903.3.6 (IBC [F] 903.3.6) Fire sprinkler riser rooms.** Where the main water control valve for automatic sprinkler systems designed in accordance with Section 903.3.1.1 is installed on the riser, the riser shall be located in a fire sprinkler riser room. Fire sprinkler riser rooms shall only contain automatic sprinkler system risers and appurtenances, fire alarm equipment and devices and fire pump equipment.~~

~~**Exceptions:**~~

1. ~~A fire sprinkler riser room is not required for automatic sprinkler systems controlled by wall-mounted post indicator valves operable from the exterior of the building.~~
2. ~~In multi-story facilities, floor control valves are permitted to be located on each floor level in an exit stairway enclosure.~~

~~**903.3.6.1 (IBC [F] 903.3.6.1) Size. Fire sprinkler riser rooms containing one fire sprinkler riser shall have a minimum area of 16 square feet (1.49 m2), with a minimum dimension of 4 feet (102 mm).**~~

~~**903.3.6.2 (IBC [F] 903.3.6.2) Working space.** A working space of not less than 36 inches (914 mm) in width, 36 inches (914 mm) in depth and 78 inches (1981 mm) in height shall be provided in front of each riser.~~

~~**903.3.6.5 (IBC [F] 903.3.6.5) Equipment access.** Fire sprinkler riser rooms shall be provided with doors and an unobstructed accessway large enough to allow removal of the largest piece of equipment.~~

~~**903.3.6 (IBC [F] 903.3.6) Fire sprinkler riser rooms.** Where the main water control valve for automatic sprinkler systems designed in accordance with Section 903.3.1.1 is installed on the riser, the riser shall be located in a fire sprinkler riser room. Fire sprinkler riser rooms shall only contain automatic sprinkler system risers and appurtenances, fire alarm equipment and devices and fire pump equipment.~~

~~**Exceptions:**~~

1. ~~A fire sprinkler riser room is not required for automatic sprinkler systems controlled by wall-mounted post indicator valves operable from the exterior of the building.~~
2. ~~In multi-story facilities, floor control valves are permitted to be located on each floor level in an exit stairway enclosure.~~

~~**903.3.6.3** **901.4.6.1** **(IBC[F] 903.3.6.3 901.8.1) Exterior Access Door.** Fire sprinkler riser rooms~~ *Automatic sprinkler system* risers, fire pumps and controllers shall ~~have an exterior access~~ be readily accessible. Where located in a fire pump room or *automatic sprinkler system* riser room, the door ~~with a minimum clear width of 32 inches (813 mm) and a minimum height of 80 inches (2032 mm)~~shall be permitted to be locked provided the key is available at all times.

~~**903.3.6.4** **901.4.6.2** **(IBC [F] 903.3.6.4 901.8.2) Marking on access doors.** Exterior access~~ Access doors for *automatic sprinkler system* riser rooms and fire ~~sprinkler riser~~ pump rooms shall be labeled ~~on the exterior side~~ with ~~the following sign or other~~ an approved ~~sign:~~

~~FIRE SPRINKLER RISER ROOM~~
~~The~~ sign. The lettering shall be in a contrasting color to the background. Letters shall have a minimum height of 2-inches (51 mm) with a minimum stroke of 3/8-inch (10 mm).

~~**903.3.6.6**~~**901.4.6.3** **(IBC [F] ~~903.3.6.6~~ 901.8.3) Environment.** ~~Fire sprinkler~~
Automatic sprinkler sprinkler riser rooms and fire pump rooms shall be maintained at a minimum temperature of 40ºF (4ºC) ~~and a maximum temperature of 100ºF (38ºC)~~or more. Heating ~~and cooling~~ units ~~for the fire sprinkler riser room~~ shall be permanently installed.

~~**Exception:** The maximum temperature requirement does not apply to fire sprinkler riser rooms that do not contain a fire alarm control unit or spare sprinkler heads.~~

~~**903.3.6.7** **901.4.6.4** **(IBC [F] 903.3.6.7 901.8.4) Lighting.**~~ Permanently installed artificial illumination shall be provided in the ~~fire sprinkler~~ *automatic sprinkler system* riser ~~room~~ rooms and fire pump rooms.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it was decided by the committee that the same room requirements that are required for fire pump rooms should also be required for automatic sprinkler riser rooms.

Assembly Action None

Final Action Results

F141-16 **AM**

Code Change No: F145-16

Original Proposal

Section: 202, 901.6.2 (New), 901.6.2.1 (New), 901.6.2.2 (New), Chapter 16, [IBC [F] 202, [F] 901.6.2 (New), [F] 901.6.2.1 (New), [F] 901.6.2.2 (New), Chapter 35

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

Add new definitions as follows:

INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEM TESTING. Integrated Fire Protection and Life Safety System Testing. A testing procedure to establish the operational status, interaction and coordination of two or more fire protection and safety systems.

SUBORDINATE (SYSTEM). A system that is activated by another fire-protection or life-safety system. For example, where a fire alarm system activates a smoke removal or elevator recall system, the smoke removal or elevator recall system is considered to be "subordinate" to the fire alarm system.

Add new text as follows:

901.6.2 Integrated Testing. Testing of fire protection systems shall be in accordance with Section 901.6.2.1 or 901.6.2.2.

901.6.2.1 General. Where two or more fire-protection or life-safety systems are interconnected, the intended response of subordinate fire-protection and life-safety systems shall be verified when required testing of the initiating system is conducted.

901.6.2.2 High-rise buildings. For high-rise buildings only, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 5 years. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire-protection or life-safety functions that are initiated by equipment that was repaired or replaced.

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

NFPA 4-2015 Standard for Integrated Fire Protection and Life Safety System Testing, Referenced in Section 901.6.2.2.

It can be viewed here:
http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=4

Reason: The IFC clearly intends to require proper operation of integrated features of fire-protection and life-safety systems. In some cases, such as a fire alarm system initiating a complex response of doors, dampers, elevators and fans in a high-rise building, the integration is highly complex, involving cooperation of many different trades, controls and systems. In other cases, such as notifying a monitoring service when a fire sprinkler operates, the integration is relatively simple. The challenge in writing a specific IFC requirement for testing of integrated systems is ensuring that required testing of integrated features is scaled in a manner that is reasonable for a wide range of applications.

NFPA 4 is a newly published standard that deals with testing of integrated systems. While there is broad agreement that the 2015 edition of this standard reasonably addresses testing of complex system integrations, such as those found in high-rise buildings, concerns have been expressed by some stakeholder groups about the suitability of this inaugural edition of the standard for less complex situations.

Accordingly, this proposal presents a two-tiered approach to integrated testing that is applicable when a code-required test is conducted. The first tier is a general requirement for verifying the functionality of fire-protection and life-safety system integrations.

Then, for high-rise buildings only, which are well known to have complex fire-protection and life-safety system integrations, NFPA 4 is referenced. The text makes it clear that the IFC will not require NFPA 4 compliance for any other application; although, that limitation could be reconsidered in the future based on changes in subsequent editions of NFPA 4.
It should also be noted that the proposed general requirement established by Section 901.6.2.1 intends to convey that required testing of integrated features should follow a top down approach, where testing of an initiating device or control warrants verification of subordinate systems or functions, but not necessarily the contrary. For example, where a smoke detector is intended to trigger an automatic damper (the damper being a "subordinate" device to the smoke detector), the test protocol should verify that the damper system responds as intended when the smoke detector activates. However, if a damper control system is tested simply to exercise dampers and to verify that dampers are operating, such testing should not require integrated testing of the initiating smoke detector or fire alarm system.

Lastly, with respect to high-rises, the proposed IFC text makes it clear that a repeat of the entire integrated test is not required when failed initiating equipment is repaired or replaced. The IFC must include this provision because NFPA 4-2015 does not provide complete guidance on the subject.

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

Cost Impact: Will increase the cost of construction
Although it is currently the intent of the IFC for fire-protection and life-safety systems to be thoroughly tested, including ensuring that integrated systems and features work properly, this requirement has not been previously addressed by specific code text. Accordingly, adding a specific requirement for integrated testing might arguably be regarded as having a construction cost impact. In addition, specifically with respect to high-rise buildings, the required planning and execution of integrated testing to comply with NFPA 4 will likely increase the cost of building commissioning tests.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 4-2015 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 1, 2016.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

INTEGRATED FIRE PROTECTION AND LIFE SAFETY SYSTEM TESTING. ~~Integrated Fire Protection and Life Safety System Testing.~~

A testing procedure to establish the operational status, interaction and coordination of two or more fire protection and safety systems.

901.6.2 ~~Integrated Testing.~~ ~~Testing of fire protection systems shall be in accordance with Section 901.6.2.1 or 901.6.2.2.~~

~~901.6.2.1~~ 901.6.2 ~~General~~ Integrated Testing. Where two or more fire-protection or life-safety systems are interconnected, the intended response of subordinate fire-protection and life-safety systems shall be verified when required testing of the initiating system is conducted. In addition, integrated testing shall be performed in accordance with Sections 901.6.2.1 and 901.6.2.2.

~~901.6.2.2~~ 901.6.2.1 High-rise buildings. For high-rise buildings~~ only~~, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding ~~5~~ 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire-protection or life-safety functions that are initiated by equipment that was repaired or replaced.

901.6.2.2 Smoke Control Systems Where a fire alarm system is integrated with a smoke control system as outlined in Section 909, integrated testing shall comply with NFPA 4, with an integrated test performed prior to issuance of the certificate of occupancy and at intervals not exceeding 10 years, unless otherwise specified by an integrated system test plan prepared in accordance with NFPA 4. If an equipment failure is detected during integrated testing, a repeat of the integrated test shall not be required, except as necessary to verify operation of fire protection or life safety functions that are initiated by equipment that was repaired or replaced.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it clarified and corrected the language of the original proposal, modified the required interval for high-rise buildings to a more widely accepted number of years and added a desired section for smoke control systems.

Assembly Action **None**

Final Action Results

F145-16 **AM**

Code Change No: F152-16

Original Proposal

Section: 903.2.1(IBC [F] 903.2.1), 903.2.1.1 (IBC [F] 903.2.1.1), 903.2.1.2 (IBC [F] 903.2.1.2), 903.2.1.3 (IBC [F] 903.2.1.3) , 903.2.1.4 (IBC [F] 903.2.1.4) , 903.2.1.5 (IBC [F] 903.2.1.5)

Proponent: Maureen Traxler, City of Seattle Dept of Construction & Inspections (maureen.traxler@seattle.gov)

Revise as follows:

903.2.1 Group A. An *automatic sprinkler system* shall be provided throughout buildings and portions thereof used as Group A occupancies as provided in this section. ~~For Group A-1, A-2, A-3 and A-4 occupancies, the *automatic sprinkler system* shall be provided throughout the story where the *fire area* containing the Group A-1, A-2, A-3 or A-4 occupancy is located, and throughout all stories from the Group A occupancy to, and including, the *levels of exit discharge* serving the Group A occupancy. For Group A-5 occupancies, the *automatic sprinkler system* shall be provided in the spaces indicated in Section 903.2.1.5.~~

~~903.2.1.1 Group A-1.~~ An *automatic sprinkler system* shall be provided ~~for *fire areas*~~ throughout stories containing Group A-1 occupancies and ~~intervening floors~~ throughout all stories from the Group A-1 occupancy to, and including, the levels of ~~the building~~ exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.
4. The *fire area* contains a multitheater complex.

903.2.1.2 Group A-2. An *automatic sprinkler system* shall be provided ~~for *fire areas*~~ throughout stories containing Group A-2 occupancies and ~~intervening floors~~ throughout all stories from the Group A-2 occupancy to, and including, the levels of ~~the building~~ exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 5,000 square feet (464 m^2).
2. The *fire area* has an *occupant load* of 100 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.3 Group A-3. An *automatic sprinkler system* shall be provided ~~for *fire areas*~~ throughout stories containing Group A-3 occupancies and ~~intervening floors~~ throughout all stories from the Group A-3 occupancy to, and including, the levels of ~~the building~~ exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.4 Group A-4. An *automatic sprinkler system* shall be provided ~~for *fire areas*~~ throughout stories containing Group A-4 occupancies and ~~intervening floors~~ throughout all stories from the Group A-4 occupancy to, and including, the levels of ~~the building~~ exit discharge serving that occupancy where one of the following conditions exists:

1. The *fire area* exceeds 12,000 square feet (1115 m^2).
2. The *fire area* has an *occupant load* of 300 or more.
3. The *fire area* is located on a floor other than a *level of exit discharge* serving such occupancies.

903.2.1.5 Group A-5. An *automatic sprinkler system* shall be provided for Group A-5 occupancies in the following areas: concession stands, retail areas, press boxes and other accessory use areas in excess of 1,000 square feet (93 m^2).

Reason: There is an inconsistency in the current code sections. 903.2.1 says that sprinklers are required on the story with the Group A and on all floors to grade, including the level of exit discharge. Sections 903.2.1.1 through 903.2.1.4 use the term "intervening" as shorthand for that requirement. However, the definition of "intervene" is "to occur or be between two things." Stories "intervening" or "between" the Group A occupancy and the level of exit discharge doesn't require sprinklers on the level of exit discharge. This proposal puts that important code provision in each section where it applies. It's worth a small amount of redundancy to gain clarity and accuracy. This proposal makes it less likely that these important code provisions will be overlooked and misapplied.

Cost Impact: Will not increase the cost of construction
This proposal clarifies existing code provisions and will have no effect on the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F152-16 **AS**

Code Change No: F153-16

Original Proposal

Section: 304.1.3, 304.1.3.1 (New), 903.2.1.5 (IBC [F] 903.2.1.5), 903.2.1.5.1 (New) [IBC [F] 903.2.1.5.1 (New)], IBC 1029.1.1.1

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

Revise as follows:

2015 International Fire Code

903.2.1.5 Group A-5. An *automatic sprinkler system* shall be provided for all enclosed Group A-5 ~~occupancies in the following areas: concession stands, retail areas, press boxes and other~~ accessory use areas in excess of 1,000 square feet (93 m^2).

Add new text as follows:

903.2.1.5.1 Spaces under grandstands or bleachers Enclosed spaces under grandstands or bleachers shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 where any of the following exist:

1. The enclosed area is 1,000 square feet or less and is not constructed in accordance with Section 1029.1.1.1.
2. The enclosed area exceeds 1,000 square feet.

Revise as follows:

304.1.3 Space underneath seats. Spaces underneath grandstand and bleacher seats shall be kept free from combustible and flammable materials. Except where enclosed in not less than 1-hour fire-resistance-rated construction in accordance with the *International Building Code*, ~~spaces underneath grandstand and bleacher seats shall not be occupied or utilized for purposes other than means of egress.~~

Add new text as follows:

304.1.3.1 Spaces underneath grandstand Spaces underneath grandstands or bleacher shall not be occupied or utilized for purposes other than means of egress except where equipped with an automatic sprinkler system in accordance with Section 903.2.1.5.1, or are separated with fire barriers and horizontal assemblies in accordance with Section 1029.1.1.1.

2015 International Building Code

Revise as follows:

1029.1.1.1 Spaces under grandstands and bleachers. ~~Where spaces~~ Spaces under *grandstands* or *bleachers* ~~are used for purposes other than ticket booths less than 100 square feet (9.29 m^2) and toilet rooms, such spaces~~ shall be separated by *fire barriers* complying with Section 707 and *horizontal assemblies* complying with Section 711 with not less than 1-hour *fire-resistance-rated* construction.

Exceptions:

1. Ticket booths less than 100 square feet in area.
2. Toilet rooms.
3. Other accessory use areas 1,000 square feet or less in area and equipped with an automatic sprinkler system in accordance with Section 903.3.1.1.

Reason: The main purpose of this proposal is to correlate the grandstand and bleacher requirements between the IFC and IBC. There are no technical changes. The accessory spaces under the bleacher or grandstand were required to be constructed of 1-hr fire barriers, but this requirement in the IBC isn't known or correlated to the IFC user. This proposal ties the requirement of both codes together.

IFC 304.1.3 - Removes text for spaces under bleachers to a new subsection 304.1.3.1.
IFC 304.1.3.1 - New text to clarify the use of the space under bleacher. The new text also correlates to new IBC 1029.1.1.1 for the general bleacher requirements (fire barrier and horizontal assemblies) and then to new IBC/IFC 903.2.1.5.1 for sprinkler requirements.
IFC/IBC 903.2.1.5 - Removes list of accessory areas and clarifies that the enclosed areas in excess of 1,000 sq. ft requires fire sprinklers.
IFC/IBC 903.2.1.5.1 - Provides sprinkler requirements for enclosed spaces under bleachers fo 1,000 sq ft and over or directs user back to IBC Section 1029.1.1.1 for passive fire protection.
IBC 1029.1.1.1- Rearranges section to pull out the list in the charging text and arranges in an exceptions list.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will not increase the cost of construction
Both requirements are established in each code. This proposal pulls together the active and passive requirements.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

304.1.3.1 Spaces underneath ~~grandstand~~ grandstands and bleachers Spaces underneath *grandstands* and *bleachers* shall not be occupied or utilized for purposes other than means of egress except where equipped with an automatic sprinkler system in accordance with Section 903.2.1.5.1, or are separated with fire barriers and horizontal assemblies in accordance with Section 1029.1.1.1.

903.2.1.5.1 Spaces under grandstands or bleachers Enclosed spaces under *grandstands* or *bleachers* shall be equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 where any of the following exist:

1. The enclosed area is 1,000 square feet or less and is not constructed in accordance with Section 1029.1.1.1.
2. The enclosed area exceeds 1,000 square feet.

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action **None**

Final Action Results

F153-16 **AM**

Code Change No: F154-16

Original Proposal

Section: 903.2.2 (IBC [F] 903.2.2)

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

Revise as follows:

903.2.2 Ambulatory care facilities. An *automatic sprinkler system* shall be installed throughout the entire floor containing an ambulatory care facility where either of the following conditions exist at any time:

1. Four or more care recipients are incapable of self-preservation, whether rendered incapable by staff or staff has accepted responsibility for care recipients already incapable.
2. One or more care recipients that are incapable of self-preservation are located at other than the level of exit discharge serving such a facility.

In buildings where ambulatory care is provided on levels other than the *level of exit discharge*, an *automatic sprinkler system* shall be installed throughout the entire floor where such care is provided as well as all floors below, and all floors between the level of ambulatory care and the nearest *level of exit discharge*, ~~including~~ the *level of exit discharge* and all floors below the level of ~~*level of*~~ *exit discharge*.

Exception: Floors classified as an open parking garage are not required to be sprinklered.

Reason: Currently the code requires sprinklering between the level that contains the ambulatory care down to the nearest level of exit discharge. This does not provide protection from issues below the nearest level of exit discharge. While this concept is covered in the federal regulation by regulating floors below the LED as a different construction type, we believe this is confusing and could be better accomplished through providing fire sprinklers throughout all levels below. There are many scenarios and designs where the nearest LED will have several floors of useable space beneath it. An exception is provided for open parking garage, consistent with other sections of the code.

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

Cost Impact: Will increase the cost of construction
Increasing sprinkler coverage below the level of exit discharge will add the cost of sprinklers. The total cost will vary per building and design. On hilly sites where there may be several floors below the LED, the cost will be more extreme. The cost impact to existing tenants by adding sprinklers should be considered as well. Some building may be ruled out by tenants due to lack of sprinkler coverage.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee stated that the proposal is unnecessary and that it is not within the intent for the existing section as written. In addition, it is a huge cost to building owners and is an overreach to a Group B occupancy classification.

Assembly Action: **None**

Final Action Results

F154-16 **AS**

Code Change No: F157-16

Original Proposal

Section(s): 903.2.3 (IBC [F] 903.2.3)

Proponent: Stephen DiGiovanni, Clark County Department of Building and Fire Prevention, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov)

Revise as follows:

903.2.3 Group E. An *automatic sprinkler system* shall be provided for Group E occupancies as follows:

1. Throughout all Group E *fire areas* greater than 12,000 square feet (1115 m^2) in area.
2. ~~Throughout every portion of educational buildings below the lowest *level of exit discharge* serving that portion of the building.~~

   ~~**Exception:** An *automatic sprinkler system* is not required in any area below the lowest *level of exit discharge* serving that area where every classroom throughout the building has not fewer than one exterior *exit* door at ground level.~~

2. The fire area has an occupant load of 50 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

   Exception: An *automatic sprinkler system* is not required in any area below the lowest *level of exit discharge* serving that area where every classroom throughout the building has not fewer than one exterior *exit* door at ground level.

Reason: Currently the Fire Code does not contain a fire sprinkler trigger in Group E occupancies based on occupant load. The occupant load derived from current code can be up to 600 persons, using the occupant load factor of 20 and the square footage trigger of 12,000 sf. This occupant load far exceeds the occupant load triggers provided for Group A occupancies. However, children are less capable of self-preservation than adults, yet the code provides more protection to adults than to children. There is also a discrepancy in construction type, whee the allowable areas for educational facilities often exceeds the allowable areas for assembly occupancies. When looking at IBC Table 503, excluding outdoor group A-5 occupancies, the allowable area for each type of construction is greater for group E occupancies than for any of Groups A-1, A-2, A-3, and A-4. Essentially, children are located in less fire-resistive buildings and with less fire sprinkler protection.

To further complicate the issue, due to recent events in society, more and more schools are developing protect-in-place strategies to ensure safety for children. It is reasonable to expect a higher level of protection for occupancies where egress may be slowed.

This proposal seeks to add a fire sprinkler trigger of 50 person occupant load for educational buildings. The 50 person trigger has been used in Clark County for 20 years. The proposal desires to expand this code requirement to the base IFC.

Cost Impact: Will increase the cost of construction
Will require a fire sprinkler system installation in many education buildings that are currently not required by the IFC to have fire sprinkler protection

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee stated that with a proposed occupancy limit of 50, the proposal is too restrictive and that portable buildings would be problematic. In addition it was stated that Group E occupancy buildings have fire drills and Group A Occupancy buildings do not.

Assembly Action: **None**

Public Comments

Public Comment 1:

Stephen DiGiovanni, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov); Nick Moriarty, representing Southern Nevada - ICC (nick.moriarty@jbace.com) requests Approve as Modified by this Public Comment.

Modify as follows:

903.2.3 Group E. An *automatic sprinkler system* shall be provided for Group E occupancies as follows:

1. Throughout all Group E *fire areas* greater than 12,000 square feet (1115 m^2) in area.
2. The fire area has an occupant load of ~~50~~ 300 or more.
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Exception: An *automatic sprinkler system* is not required in any area below the lowest *level of exit discharge* serving that area where every classroom throughout the building has not fewer than one exterior *exit* door at ground level.

Commenter's Reason: The IFC Committee and assembly raised several objections to the proposal, including: (a) the proposed threshold is way too low; (b) no technical justification was provided to support the proposal (i.e., no demonstration of need, loss data, etc.); (c) schools respond to fire alarms and have orderly evacuations, so the comparison of Group E to Group A is not valid; and (d) the proposal is too punitive for portable classroom buildings (e.g., double-wide trailers). During the testimony on F157-16, the committee stated that they felt that the proposed trigger of 50 occupants was too low, there was little justification to the reasoning of the trigger, and specifically there was no loss history associated with school fires. The proposal has been modified to address two of the committee's concerns, one being that the occupant load was too low and the question as to why the threshold for fire area was still listed as 12,000 square feet. Utilizing an occupant load factor 20 square feet/person, the area of 6,000 square feet and occupant load of 300 now correlate.

The 300 threshold is also used as a trigger for sprinklers in Group A-1, A-3 and A-4 occupancies. This is a common threshold used throughout the code, including the examples noted above, plus for manual fire alarm systems in Group A per IFC 907.2.1, assembly main exit provisions per IFC Section 1028.2, horizontal building separation allowances in IBC Section 510.2, Class C interior finishes in non-sprinklered Group A-1 or A-2 rooms or enclosed spaces per IBC Table 803.9 footnote e, door locks and latches in Group A per IBC Section 1008.1.9.3.

One of the other reasons for disapproval that was brought up during testimony was that schools typically have fire drills and therefore the occupants are familiar with how to evacuate during an event. This is true, however many schools serve multiple purposes, including parent/teacher conference night, open houses for prospective parents and students who may have never been to the school, political elections and adult education classes during the evening. If these uses are to be allowed, then the actual use of the school would be more of a Group A, not Group E, since the population is predominantly adults in the after-hours situations.

Sprinklers are widely recognized as the single most effective method for fighting the spread of fires in the early stages, before they can cause severe injury to people and damage to property. With regards to the issue related to loss data, the below table shows NFPA records of historical fire data.

Event	Date	Number of deaths
Consolidated School (PDF, 825 KB), gas explosion New London, TX	March 18, 1937	294
Lakeview School (PDF, 581 KB) Collinwood, OH	March 4, 1908	175
Our Lady of the Angels School (PDF, 1 MB) Chicago, IL	December 1, 1958	95
The Cleveland School (PDF, 1.6 MB) Kershaw County, South Carolina	May 17, 1923	77
Bath Consolidated School Bath, MI	May 18, 1927	46
Babbs Switch School (PDF, 770 KB) Hobart, OK	December 24, 1924	32
St. John's Parochial School (PDF, 1.7 MB) Peabody, MA	October 28, 1915	21
Cleveland Hill School (PDF, 1 MB) Cheektowaga, NY	March 31, 1954	15

Source: NFPA Historical Records

Regarding the cost impact, AFSA details that sprinklers account for approximately 1-2% of the total construction cost of buildings. Therefore, the overall cost impact to install a sprinkler system in a school is relatively minor.

Final Action Results

F157-16 **AMPC1**

F157-16

F] 903.2.3 Group E. An *automatic sprinkler system* shall be provided for Group E occupancies as follows:
1. Throughout all Group E *fire areas* greater than 12,000 square feet (1115 m2) in area.
2. Throughout every portion of educational buildings below the lowest *level of exit discharge* serving that portion of the building.

Exception: An *automatic sprinkler system* is not required in existing educational buildings unless 50 percent of the aggregate area of the building is being remodeled.

Code Change No: F163-16

Original Proposal

Section: 903.2.11.1 (IBC [F] 903.2.11.1)

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

Revise as follows:

903.2.11.1 Stories without openings. An *automatic sprinkler system* shall be installed throughout all stories, including *basements*, of all buildings where the floor area exceeds 1,500 square feet (139.4 m^2) and where ~~there is~~ the story does not ~~provided not fewer than one of~~ comply with the following ~~types of *exterior wall*~~ criteria for exterior wall openings:

1. Openings below grade that lead directly to ground level by an exterior *stairway* complying with Section 1011 or an outside ramp complying with Section 1012. Openings shall be located in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm).
2. Openings entirely above the adjoining ground level totaling not less than 20 square feet (1.86 m^2) in each 50 linear feet (15 240 mm), or fraction thereof, of *exterior wall* in the story on at least one side. The required openings shall be distributed such that the lineal distance between adjacent openings does not exceed 50 feet (15 240 mm). The height of the bottom of the clear opening shall not exceed 44 inches (1118 mm) measured from the floor.

Reason: This code change is intended to provide language that clarifies the intended requirements by removing the double negative that is found in the current code section.

Cost Impact: Will not increase the cost of construction
This is simply language change and would not increase construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F163-16	**AS**

Code Change No: F165-16

Original Proposal

Section: 903.3.1.1.2 (IBC [F] 903.3.1.1.2)

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

Revise as follows:

903.3.1.1.2 Bathrooms. In Group R occupancies~~, other than Group R-4 occupancies,~~ sprinklers shall not be required in bathrooms that do not exceed 55 square feet (5 m^2) in area and are located within individual *dwelling units* or *sleeping units*, provided that walls and ceilings, including the walls and ceilings behind a shower enclosure or tub, are of noncombustible or limited-combustible materials with a 15-minute thermal barrier rating.

Reason: This exception is permitted for all other Group R occupancies. NFPA 101 does not require sprinklers in bathrooms based on fire studies in similar occupancies. There is no technical reason to require sprinklers in bathrooms in Group R-4.

This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC.

Cost Impact: Will not increase the cost of construction
This is a reduction in sprinkler coverage requirements from current code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F165-16 **AS**

Code Change No: F170-16

Original Proposal

Section(s): 903.3.1.2.1 (IBC [F] 903.3.1.2.1)

Proponent: William Hall, Portland Cement Association (jhall@cement.org)

Revise as follows:

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where the building is of Type V construction, provided there is a roof or deck above. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where the building is of Type III and IV construction and where there is a combustible balcony, roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

Reason: IBC Section 1406.3 exception #3 permits combustible balconies and decks on the exterior walls of Type III, IV and V construction only if sprinkler protection is extended out to these areas. This proposal brings forth the exception and places it within the Balconies and Decks section located in Chapter 9 section 903.3.1.2.1.
A fire which begins on a combustible balcony or deck has the same propensity to spread vertically and involve several floors at the same time, overwhelming a sprinkler system while fire continues to spread up the building regardless of construction type. Vertical fire from the balcony or deck can run up to the combustible roof which may not have sprinkler protection in the attic. Construction Types I and II allow fire retardant treated wood or Heavy Timber for three stories or less.
IBC Section 1403 (Shown for reference only)

1406.3 Balconies and similar projections. Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of Type IV construction in accordance with Section 602.4. The aggregate length of the projections shall not exceed 50 percent of the building's perimeter on each floor.

Exceptions:

1. On buildings of Type I and II construction, three stories or less above *grade plane*, *fire-retardant-treated wood* shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.
2. Untreated wood is permitted for pickets and rails or similar guardrail devices that are limited to 42 inches (1067 mm) in height.
3. Balconies and similar projections on buildings of Type III, IV and V construction shall be permitted to be of Type V construction, and shall not be required to have a *fire-resistance rating* where sprinkler protection is extended to these areas.

A fire which begins on a combustible balcony or deck has the same propensity to spread vertically and involve several floors at the same time, overwhelming a sprinkler system while fire continues to spread up the building regardless of construction type. Vertical fire from the balcony or deck can run up to the combustible roof which may not have sprinkler protection in the attic. Construction Types I and II allow fire retardant treated wood or Heavy Timber for three stories or less.

Cost Impact: Will not increase the cost of construction
This proposal does not add any new requirements and therefore will not increase the cost of construction.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee stated that the new proposed text is confusing and does not clearly state the requirement.

Assembly Action: **None**

Public Comments

Public Comment 1:

Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com); William Hall, Portland Cement Associations, representing Portland Cement Association (jhall@cement.org) requests Approve as Modified by this Public Comment.

Replace proposal as follows:

2015 International Fire Code

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where ~~the~~:

1. The building is of Type V construction, provided there is a roof or deck above, or
2. Exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* are constructed in accordance with Section 1406.3 exception 3 of the *International Building Code*.

Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

2015 International Building Code

[F] 903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where ~~the~~:

1. The building is of Type V construction, provided there is a roof or deck above, or
2. Exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* are constructed in accordance with Section 1406.3 exception 3.

Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

Commenter's Reason: Correlation with the balcony sprinkler requirements in Section 1406.3 Ex. 3

Final Action Results

F170-16 **AMPC1**

Code Change No: F172-16

Original Proposal

Section: 903.3.1.2.3 (New) (IBC [F] 903.3.1.2.3 (New)), 903.2.8.3 ([F] 903.2.8.3) , 903.2.8.3.1 (IBC [F] 903.2.8.3.1), 903.2.8.3.2 (IBC [F] 903.2.8.3.2)

Proponent: Jeffrey Shapiro, representing National Multifamily Housing Council ((jeff.shapiro@intlcodeconsultants.com); Michael O'Brian representing the Fire Code Action Committee (FCAC@iccsafe.org)

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 number of stories of Group R occupancies constructed in accordance with Sections 510.2 and 510.4 of the *International Building Code* shall be measured from the horizontal assembly creating separate buildings.

Add new text as follows:

903.3.1.2.1 Balconies and decks. Sprinkler protection shall be provided for exterior balconies, decks and ground floor patios of *dwelling units* and *sleeping units* where the building is of Type V construction, provided there is a roof or deck above. Sidewall sprinklers that are used to protect such areas shall be permitted to be located such that their deflectors are within 1 inch (25 mm) to 6 inches (152 mm) below the structural members and a maximum distance of 14 inches (356 mm) below the deck of the exterior balconies and decks that are constructed of open wood joist construction.

903.3.1.2.2 Open-ended corridors. Sprinkler protection shall be provided in *open-ended corridors* and associated *exterior stairways* and *ramps* as specified in Section 1027.6, Exception 3.

903.3.1.2.3 Attics Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.
2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.
3. Where located in a building of Type III or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the *International Building Code*, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   d. Fill the attic with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include

only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:
   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   e. Fill the attic with noncombustible insulation.

Revise as follows:

[F] 903.2.8.3 Group R-4 Condition 2. An *automatic sprinkler system* installed in accordance with Section 903.3.1.2 shall be permitted in Group R-4 Condition 2 occupancies. ~~Attics shall be protected in accordance with Section 903.2.8.3.1 or 903.2.8.3.2.~~

Delete without substitution:

~~**[F] 903.2.8.3.1 Attics used for living purposes, storage or fuel-fired equipment.** Attics used for living purposes, storage or fuel-fired equipment shall be protected throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.2.~~

~~**[F] 903.2.8.3.2 Attics not used for living purposes, storage or fuel-fired equipment.** Attics not used for living purposes, storage or fuel-fired equipment shall be protected in accordance with one of the following:~~

~~1. Attics protected throughout by a heat detector system arranged to activate the building fire alarm system in accordance with Section 907.2.10.~~
~~2. Attics constructed of noncombustible materials.~~
~~3. Attics constructed of fire-retardant-treated wood framing complying with Section 2303.2 of the International Building Code.~~
~~4. The automatic sprinkler system shall be extended to provide protection throughout the attic space.~~

Reason: This proposal is recommended as a response to fire-service concerns about suppressing a fire involving a tall pedestal building attic. Such attic or attics will be required to have increased fire protection. The proposed threshold is modeled after a combination of two existing code sections, Appendix D Section 105.1 (which establishes requirements for aerial ladder access based on attic height) and Section 903.2.11.3 (which uses 55 feet as a building height threshold related to sprinklers). Pedestal buildings that exceed 4 stories above grade plane, including the pedestal, are anticipated to be affected by this proposal, as would be some pedestal buildings with fewer stories that are located on sloped lots with fire department vehicle access roads required along a lower-elevation portion of the perimeter. The intent of stating "required" fire vehicle access is to make it clear that, simply because access is available on an adjacent road or parking lot, that road need not be considered in the height measurement unless it is required as part of satisfying the code requirement for vehicle access to the building.

The permissible attic protection options for pedestal buildings are generally modeled after existing Section 903.2.8.3, which was added to the 2015 code for R-4 Condition 2 occupancies. However, based on feedback received during the drafting/review process for this proposal, it was decided to exclude the R-4's heat-detection option for pedestal building attic protection because numerous stakeholders did not consider heat detection as equivalent in safety to the other listed options.

Note that allowances to use noncombustible construction materials, fire-retardant treated wood, and filling with noncombustible insulation are already permitted by NFPA 13 as an alternative to installing sprinklers in concealed spaces in otherwise fully-sprinklered buildings. These allowances are duplicated in the proposed IBC/IFC text so that an architect or developer can identify the attic protection concern and permissible solutions early in the design process, as opposed to expecting building designers to know of these allowances buried deep in the text of NFPA 13. Having the exceptions in the IBC/IFC will make it clear that these NFPA 13 exceptions are appropriate for NFPA 13R attic protection as well, even though they are not included in NFPA 13R (because NFPA 13R doesn't ordinarily require attics to be protected).

Finally, the proposal relocates the existing requirements in 903.2.8.3 for enhanced attic protection in Group R-4 Condition 2 occupancies to the new Section 903.3.1.2.3 so that all IBC/IFC supplemental protection requirements for NFPA 13R sprinkler systems are consolidated in one location. The existing requirements for R-4 Condition 2 were also revised with respect to fuel-fired equipment in attics to clarify that, in an otherwise unsprinklered attic, the entire attic wouldn't be required to be sprinklered based on

the presence of fuel-fired equipment. Instead, NFPA 13R (Section 6.6.6.1 of the 2013 edition) only requires that a sprinkler be installed over the equipment in such cases.

Cost Impact: Will increase the cost of construction
The added requirement for attic protection will increase the cost of construction for affected buildings.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

903.3.1.2.3 Attics. Attic protection shall be provided as follows:

1. Attics that are used or intended for living purposes or storage shall be protected by sprinklers.
2. Where fuel-fired equipment is installed in an unsprinklered attic, at least one quick-response intermediate temperature sprinkler shall be installed above the equipment.
3. Where located in a building of Type III, Type IV or Type V construction designed in accordance with Section 510.2 or Section 510.4 of the *International Building Code*, attics not required by Item 1 to have sprinklers shall comply with one of the following if the roof assembly is located more than 55 feet (16 764 mm) above the lowest level of required fire department vehicle access:
   a. Provide sprinkler protection.
   b. Construct the attic using noncombustible materials.
   c. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   d. Fill the attic with noncombustible insulation.

The height of the roof assembly shall be determined by measuring the distance from the lowest required fire vehicle access road surface adjacent to the building to the eave of the highest pitched roof, the intersection of the highest roof to the exterior wall, or the top of the highest parapet, whichever yields the greatest distance. For the purpose of this measurement, required fire vehicle access roads shall include only those roads that are necessary for compliance with Section 503.

4. Group R-4 Condition 2 occupancy attics not required by Item 1 to have sprinklers shall comply with one of the following:

   a. Provide sprinkler protection.
   b. Provide a heat detector system throughout the attic that is arranged to activate the building fire alarm system in accordance with Section 907.2.10.
   c. Construct the attic using noncombustible materials.
   d. Construct the attic using fire-retardant-treated wood complying with Section 2303.2 of the *International Building Code*.
   e. Fill the attic with noncombustible insulation.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it was desired by the committee to extend the new requirements to Type IV in addition to Types III and V construction buildings.

Assembly Action **None**

Final Action Results

F172-16 **AM**

Code Change No: F174-16

Original Proposal

Section: 904.12 (IBC [F] 904.12)

Proponent: Lori Jessell, Novato Fire Protection District, representing California Fire Chiefs Association; Adria Reinertson, Riverside County Fire Department (adriar@moval.org)

Revise as follows:

904.12 Commercial cooking systems. The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry and wet chemical extinguishing systems shall be tested in accordance with UL 300 and *listed* and *labeled* for the intended application. Other types of automatic fire extinguishing systems shall be *listed* and *labeled* for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, NFPA 96, its listing and the manufacturer's installation instructions. Automatic fire extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. *Automatic sprinkler systems*, NFPA 13.
3. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
4. Dry-chemical extinguishing systems, NFPA 17.
5. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and *listed*, *labeled* and installed in accordance with Section 304.1 of the *International Mechanical Code*.

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

NFPA 96-2014 - Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations

Reason: IFC Chapter 9 scope is for the design, installation, inspection, operation, testing and maintenance of all fire protection systems. Section 904.12 is the logical location to provide guidance to the fire protection system designer and Code Official as to where to locate pertinent language to the design, installation, inspection, operation, testing and maintenance for fire protection systems for commercial cooking operations. Having a direct reference from the International Fire Code to NFPA 96 standard, similar to the references to NFPA standards for specific system types found in items 1-5 of the Section 904.12, provides for a more efficient reference to applicable standards than sending the system designer or Code Official through the Mechanical Code. The purpose of NFPA 96, the standard for ventilation control and fire protection of commercial cooking operations, is to reduce the potential fire hazard of cooking operations and is relevant to the International Fire Code, Chapter 9, Section 904.12 Commercial Cooking Systems section.

The standard can be viewed here:
http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=96

Cost Impact: Will not increase the cost of construction
This language is editorial in nature to clarify the use of the appropriate NFPA Standard.

Analysis: NFPA 96 is already referenced in the IMC. This is simply a new occurance of the reference in the I-Codes.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F174-16 **AS**

Code Change No: F175-16

Original Proposal

Section: 904.12 (IBC [F] 904.12)

Proponent: Christopher Moran, Jensen Hughes, representing United Technologies Corporation/Marioff (cmoran@jensenhughes.com)

Add new text as follows:

904.12 Commercial cooking systems. The automatic fire-extinguishing system for commercial cooking systems shall be of a type recognized for protection of commercial cooking equipment and exhaust systems of the type and arrangement protected. Preengineered automatic dry and wet chemical extinguishing systems shall be tested in accordance with UL 300 and *listed* and *labeled* for the intended application. Other types of automatic fire extinguishing systems shall be *listed* and *labeled* for specific use as protection for commercial cooking operations. The system shall be installed in accordance with this code, its listing and the manufacturer's installation instructions. Automatic fire extinguishing systems of the following types shall be installed in accordance with the referenced standard indicated, as follows:

1. Carbon dioxide extinguishing systems, NFPA 12.
2. *Automatic sprinkler systems*, NFPA 13.
3. *Automatic water mist systems*, NFPA 750.
4. Foam-water sprinkler system or foam-water spray systems, NFPA 16.
5. Dry-chemical extinguishing systems, NFPA 17.
6. Wet-chemical extinguishing systems, NFPA 17A.

Exception: Factory-built commercial cooking recirculating systems that are tested in accordance with UL 710B and *listed*, *labeled* and installed in accordance with Section 304.1 of the *International Mechanical Code*.

Reason: Water mist systems from multiple companies are approved by FM Global for use in industrial oil cookers and should be included in this section with the other suppression alternatives for commercial cooking systems. This will give owners another option that has been shown to be effective. A list of the systems approved by FM Global are attached.

Cost Impact: Will not increase the cost of construction
This only provides another suppression option and would not increase the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F175-16 **AS**

Code Change No: F176-16

Original Proposal

Section: 904.12.5, 904.12.5.1, 904.12.5.2, 904.13.2 (IBC [F] 904.13.2), 906.1 (IBC [F] 906.1), 906.4 (IBC F] 906.4)

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

Delete without substitution:

~~**904.12.5 Portable fire extinguishers for commercial cooking equipment.** Portable fire extinguishers shall be provided within a 30-foot (9144 mm) distance of travel from commercial-type cooking equipment. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher in accordance with Section 904.12.5.1 or 904.12.5.2, as applicable.~~

~~**904.13.2 Portable fire extinguishers for domestic cooking equipment in Group I-2 Condition 1.** A portable fire extinguisher complying with Section 906 shall be installed within a 30-foot (9144 mm) distance of travel from domestic cooking appliances.~~

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.

   Exception: 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. Within 30 feet (9144 mm) of commercial cooking equipment.~~
2. Within 30 feet (9144 mm) distance of travel from commercial cooking equipment, and from domestic cooking equipment in Group I-2 Condition 1.
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*.

906.4 Cooking ~~grease~~ equipment fires. Fire extinguishers provided for the protection of cooking ~~grease fires~~ equipment shall be of an *approved* type compatible with the automatic fire-extinguishing system agent. Cooking equipment involving solid fuels or vegetable or animal oils and fats shall be protected by a Class K rated portable extinguisher in accordance with Section ~~904.12.5~~906.1, item 2, 906.4.1 and 906.4.2 as applicable.

Revise as follows:

~~**904.12.5.1**~ **906.4.1 Portable fire extinguishers for solid fuel cooking appliances.** *No change to text.*

~~**904.12.5.2**~ **906.4.2 Class K portable fire extinguishers for deep fat fryers.** Where hazard areas include deep fat fryers, listed Class K portable fire extinguishers shall be provided as follows:

1. For up to four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity.
2. For every additional group of four fryers having a maximum cooking medium capacity of 80 pounds (36.3 kg) each: one additional Class K portable fire extinguisher of a minimum 1.5-gallon (6 L) capacity shall be provided.
3. For individual fryers exceeding 6 square feet (0.55 m^2) in surface area: Class K portable fire extinguishers shall be installed in accordance with the extinguisher manufacturer's recommendations.

Reason: The portable fire extinguishers requirements are not in the correct section, which is section 906 entitled Portable Fire Extinguishers. This proposal corrects the problem as follows:

- The requirements in 904.13.2 were moved to 906.1 and Section 904.13.2 was deleted.
- 904.12.5 contained the requirements for travel distance which were already covered by section 906.1 and the cooking equipment requirements were moved to 906.4.
- 904.12.5.1 and 904.12.5.2 were simply renumbered and will become sections 906.4.1. and 906.4.2

Cost Impact: Will not increase the cost of construction
This simply moves the already existing requirements from one code section to another no substantive changes were made.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F176-16 **AS**

Code Change No: F177-16

Original Proposal

Section: 904.13 (IBC [F] 904.13), 904.13.1 (IBC [F] 904.13.1), 904.13.2 (IBC [F] 904.13.2)

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

Revise as follows:

904.13 Domestic cooking systems in ~~Group~~ Groups I-1 or I-2 Condition 1. In ~~Group~~ Groups I-1 or I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*, the domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Preengineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.

904.13.1 Manual system operation and interconnection. Manual actuation and system interconnection for the hood suppression system shall be in accordance with Sections 904.12.1 and 904.12.2, respectively.

904.13.2 Portable fire extinguishers ~~for domestic cooking equipment in Group I-2 Condition 1~~. *No change to text.*

Reason: This is coordination with G123-15(AS) and M45-15(AS). G 123-15 added criteria for domestic cooking in Group I-1 areas with a limited number of residents. M45-15 added a reference to this section for hoods in both Group I-1 and I-2.

Section 904.13.2 is a subsection of 904.13, so the group does not have to be in the title. In addition, the group is not in the text.

This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC.

Cost Impact: Will not increase the cost of construction
This clarification that will most likely reduce the cost of the hoods required.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F177-16 **AS**

Code Change No: F178-16

Original Proposal

Section: 904.13 (IBC [F] 904.13)

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

Revise as follows:

904.13 Domestic cooking systems in Group I-2 Condition 1. In Group I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*, the domestic recirculating or exterior vented cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Preengineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.

Reason: NFPA 96 allows for recirculating hoods in commercial kitchens. These kitchens are not commercial cooking, but are limited to domestic cooking for a limited number of residents. This will not be a health issue for residents, but is needed to allow for flexibility in design of these spaces. The aromas of cooking are one of the primary benefits for allowing kitchens in these home-like environments.

This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC.

Cost Impact: Will not increase the cost of construction
This will be either a reduction or no change to construction requirements for venting.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F178-16	**AS**

Code Change No: F179-16

Original Proposal

Section: 904.13 (IBC [F] 904.13), 904.13.1 (IBC [F] 904.13.1), 904.13.1.1 (New) (IBC [F] 904.13.1.1), 904.13.1.2 (New) (IBC [F] 904.13.1.2 (New)), 904.13.2, IBC [F] 904.13.2)

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

Delete and substitute as follows:

904.13 Domestic cooking systems ~~in Group I-2 Condition 1~~. ~~In Group I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*, the domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Preengineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.~~

Cooktops and ranges installed in the following occupancies shall be protected in accordance with Sections 904.13.1 through 904.13.2:

1. In Group I-2 Condition 1 occupancies where domestic cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*.
2. In Group R-2 college dormitories where domestic cooking facilities are installed in accordance with Section 420.7 of the *International Building Code*.

904.13.1 ~~Manual system operation and interconnection~~ Protection from fire. ~~Manual actuation and system interconnection for the hood suppression system shall be in accordance with Sections 904.12.1 and 904.12.2, respectively.~~

Cooktops and ranges shall be protected in accordance with Section 904.13.1.1 or 904.13.1.2.

Add new text as follows:

904.13.1.1 Automatic fire-extinguishing system. The domestic cooking hood provided over the cooktop or range shall be equipped with an approved automatic fire-extinguishing system complying with the following:

1. The automatic fire-extinguishing system shall be of a type recognized for protection of domestic cooking equipment. Pre-engineered automatic fire-extinguishing systems shall be listed and labeled in accordance with UL 300A and installed in accordance with the manufacturer's instructions.
2. Manual actuation of the fire-extinguishing system shall be provided in accordance with Section 904.12.1.
3. Interconnection of the fuel and electric power supply shall be in accordance with Section 904.12.2.

904.13.1.2 Ignition prevention. Cooktops and ranges shall include burners that have been tested and listed to prevent ignition of cooking oil with burners turned on to their maximum heat settings and allowed to operate for 30 minutes.

Revise as follows:

904.13.2 Portable fire extinguishers ~~for domestic cooking equipment in Group I-2 Condition 1~~. *No change to text.*

Reason: This proposal was developed by a Fire Code Action Committee working group consisting of FCAC, industry and fire service representatives.

Group A code proposals G 105-15 and G 121-15 were approved as submitted. These proposals covered the use of domestic cooking systems in Group I-2, Condition 1 occupancies and Group R-2 college dormitories. The reason statements for both proposals references that changes were needed to IBC/IFC Section 904.13 to provide correlation. This proposal provides this correlation, and makes no substantive changes to the existing Section 904.13 requirements, which are shown below. Section 904.13.1.1 includes some of the automatic fire-extinguishing requirements that were previously located in IBC Section 407.2.6. 904.13.1.2 allows an option for cooktops and ranges with listed ignition resistant burners that do not allow cooking oils to ignite during testing to be provided in lieu of an automatic fire-extinguishing system. Recent work by the Fire Protection Research Foundation confirms that burners meeting these specifications are highly unlikely to ignite cooking materials.

See: http://www.nfpa.org/research/fire-protection-research-foundation/reports-and-proceedings/other-research-topics/analytical-modeling-of-pan-and-oil-heating-on-an-electric-coil-cooktop.

The UL 858 Standard for Safety for Household Electric Ranges was recently revised to include a new Section 60A Abnormal Operation - Coil Surface Unit Cooking Oil Ignition Test that evaluates the ability of burners to not ignite cooking oil.

Existing 2015 IFC text (for reference only):

904.13 Domestic cooking systems in Group I-2 Condition 1. In Group I-2 Condition 1 occupancies where cooking facilities are installed in accordance with Section 407.2.6 of the *International Building Code*, the domestic cooking hood provided over the cooktop or range shall be equipped with an automatic fire-extinguishing system of a type recognized for protection of domestic cooking equipment. Pre-engineered automatic extinguishing systems shall be tested in accordance with UL 300A and listed and labeled for the intended application. The system shall be installed in accordance with this code, its listing and the manufacturer's instructions.

904.13.1 Manual system operation and interconnection. Manual actuation and system interconnection for the hood suppression system shall be in accordance with Sections 904.12.1 and 904.12.2, respectively.

904.13.2 Portable fire extinguishers for domestic cooking equipment in Group I-2 Condition 1. A portable fire extinguisher complying with Section 906 shall be installed within a 30-foot (9144 mm) distance of travel from domestic cooking appliances.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will not increase the cost of construction
This proposal provides correlation with new IBC requirements for the domestic cooktops used in non-household occupancies. The option to use cooktops with ignition resistant burners in lieu of an automatic extinguishing system has the potential to actually reduce the cost of construction in these occupancies.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F179-16 **AS**

Code Change No: F180-16

Original Proposal

Section: 901.6.1, 904.13 (New) (IBC [F] 904.13 (New)), 904.13.1 (New)

Proponent: Anthony Gee, Fireaway Inc., representing self (agee@statx.com)

Revise as follows:

TABLE 901.6.1
FIRE PROTECTION SYSTEM MAINTENANCE STANDARDS

SYSTEM	STANDARD
Portable fire extinguishers	NFPA 10
Carbon dioxide fire-extinguishing system	NFPA 12
Halon 1301 fire-extinguishing systems	NFPA 12A
Dry-chemical extinguishing systems	NFPA 17
Wet-chemical extinguishing systems	NFPA 17A
Water-based fire protection systems	NFPA 25
Fire alarm systems	NFPA 72
Smoke and heat vents	NFPA 204
Water-mist systems	NFPA 750
Clean-agent extinguishing systems	NFPA 2001
Aerosol fire extinguishing systems	NFPA 2010

Add new text as follows:

904.13 Aerosol Fire Extinguishing Systems Aerosol fire extinguishing systems shall be installed, periodically inspected, tested and maintained in accordance with sections 901 and 904.4, NFPA 2010, and in accordance with their listing.

Such devices and appurtenances shall be listed and installed in conformance with manufacturer's instructions.

904.13.1 Maintenance. Not less than semi-annually, an inspection shall be conducted by a trained person to assess whether the system is in working order. A certified fire suppression contractor trained and having knowledge of the installation, operation and maintenance of the specific fire extinguishing system shall inspect, test, service and maintain such system in accordance with this section and the manufacturer's specifications and servicing manuals not less than annually.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 2010, Edition 2015, Standard for Fixed Aerosol Fire-Extinguishing Systems 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 1, 2016.

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

NFPA 2010, Edition 2015, Standard for Fixed Aerosol Fire-Extinguishing Systems

It can be viewed here:
http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=2010

Reason: In 2006, the NFPA 2010 (Edition 2006) Standard for Fixed Aerosol Fire Extinguishing Systems was first published.
In 2011, the International Code Council Evaluation Service published the ICC-ES Acceptance Criteria for Fixed Condensed Aerosol Fire-Extinguishing Systems AC432.

In 2013, the New York City Fire Code was amended to modify Section FC 904 FIRE EXTINGUISHING SYSTEMS to include a new subsection 904.13 Aerosol Fire Extinguishing Systems that comply with NFPA 2010 (current Edition 2015).
In 2014, the ICC-ES published its first Division: 21 00 00 Fire Suppression, Section 21 22 18 Fixed Condensed Aerosol Extinguishing System Units evaluation report ESR-3230 for an aerosol fire suppression system in compliance with IFC 2009 and IFC 2012 as an alternative to IFC 904.9 Halon Fire Extinguishing Systems.

In 2014, ANSI approved UL standard UL 2775 Standard for Fixed Condensed Aerosol Extinguishing System Units.

Cost Impact: Will not increase the cost of construction
Condensed aerosol fire suppression systems used as total flooding systems for the protection of Class A (surface), Class B, and Class C hazards can reduce construction, installation, and maintenance costs compared with existing fire suppression systems. This technology does not use compressed gas cylinders nor pressure rated piping. Generally these systems are electrically operated when integrated with ICC IFC approved fire alarm and releasing control systems and approved/listed releasing panels, or are deployed as automatic stand-alone fire extinguishing units. Typically these extinguishing units are designed as disposable devices with a minimum 10 year shelf life.

As there are no piping distribution systems required, no special storage requirements for compressed gas bottles, and the ability of the flooding agent to protect areas with limited leakage, the construction costs involving these systems are typically lower than conventional chemical and gas fire extinguishing systems requiring gas pressure.

Furthermore the technology remains effective even with leakage in the space, and therefore offers an alternative fire suppression technology for existing installations involving reconstruction or new construction of areas with special hazards, and where total room integrity construction is problematic.

As the units are designed to be disposable, generally they require very little maintenance and consequently offer low long term life cycle costs to facility operators.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F180-16 **AS**

Code Change No: F183-16

Original Proposal

Section: 905.12 (New) (IBC [F] 905.12 (New))

Proponent: David Kerr, Plano Fire Rescue, representing Plano Fire Rescue (davidk@plano.gov)

Add new text as follows:

905.12 Locking Standpipe Outlet Caps The fire code official is authorized to require locking caps on the outlets on dry standpipe connections where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.

Reason: Standpipe connection caps are vulnerable to theft. Vandalism is a concern when trash and debris are introduced into the outlet. The debris will flow directly to the fire fighters nozzle creating a life safety issue for fire fighters. The other problem that exists is with dry systems. When one or more valves are open within the system, and the fire department pumps to the system, the correct flow and pressure will not reach the fire fighters, causing a delay in the application of water. This delay can create increased property damage and life safety issues. This provision, when applied, will require the protected FDC and protected standpipe caps to have a compatible and standard opening mechanism.

Cost Impact: Will increase the cost of construction
The cost is $103.00 per outlet protected. In a normal highrise with two stairs the cost would be $206.00 per floor.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

905.12 Locking Standpipe Outlet Caps The fire code official is authorized to require locking caps on the outlets on dry ~~standpipe connections~~ standpipes where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it clarifies that the section applies only to the standpipe discharge outlets.

Assembly Action **None**

Final Action Results

F183-16	AM

Code Change No: F184-16

Original Proposal

Section: 905.3.1 (IBC [F] 905.3.1)

Proponent: Daniel Nichols, representing State of New York (dnichols@dos.state.ny.us)

Revise as follows:

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where any one of the folowing conditions exist:

1. Four or more stories 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~~, or where the~~.
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 manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in *basements* equipped throughout with an *automatic sprinkler system*.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   5.1. Recessed loading docks for four vehicles or less.
   5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Reason: The current requirements for the need for standpipes is based upon the distance from the lowest level of FD vehicle access to the floor level of the highest story or the converse condition. For a building with 10 foot story heights and the FD vehicle access at the same datum as the first story, this would make a four story building meeting these requirements the minimum height where standpipes are required.

Seldom does this exact condition exist. However, the arrangement of stairways inside of the buildings where standpipes are normally located doesn't substantially change based on whether the FD vehicle access is 1 foot higher or the story height is a few inches lower. Since the fire department is the primary user of standpipes, the ability to stretch hoselines should be the priority in developing requirements based on height. For every landing that the FD needs to stretch a hoseline around when advancing it from the ground level, it delays deployment for firefighting operations and requires additional personnel to complete it effectively. Furthermore, having a more consistent requirement based on the building rather than differences in height measurement is beneficial to firefighters during initial building size-up.

From a practical standpoint, a four story building with a stretch from the ground level requires the distance from the fire apparatus access road to the exit stairway, up the stairway, and to all portions of the upper story. In an unsprinklered 4-story Group B occupancy, this could be 150ft (IFC 503) + 200 feet (50ft. per story) + 200 feet (Table 1017.2) = 550 feet of attack hose. With a standpipe, this would be 150 feet (905.4 #6) and would not require the need to stretch hoselines up stairways.

The orginial requirements of 30 feet above or below the FD vehicle access is maintained to deal with buildings with large story heights and to address buildings built with significant grade changes.

Cost Impact: Will increase the cost of construction
This proposal will increase the cost of construction for unsprinklered buildings that are four stories and previously were arranged to stay below the 30 foot requirement since a Class III standpipe will need to be installed. This proposal will increase the cost of construction for sprinklered buildings that are four stories and previously were arrnaged to stay below the 30 foot requirement since Class I FD hose outlets and larger riser piping will be to be installed.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where any ~~one~~ of the following conditions exist:

1. Four or more stories 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, or where the.
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 manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
3. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
4. Class I standpipes are allowed in basements equipped throughout with an automatic sprinkler system.
5. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   5.1. Recessed loading docks for four vehicles or less.
   5.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because the deletion of the word "one" makes it clear that having more than one of the listed conditions will still require the installation.

Assembly Action **None**

Final Action Results

F184-16 **AM**

Code Change No: F185-16

Original Proposal

Section(s): 905.3.1 (IBC [F] 905.3.1)

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

Add new text as follows:

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in *basements* equipped throughout with an *automatic sprinkler system*.
6. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   6.1. Recessed loading docks for four vehicles or less.
   6.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Reason: The purpose of this code change proposal is to have a discussion on the need for occupant-use hose in Group B and E occupancies. The proposal is written to remove the occupant-use hose from these occupancies by switching from a Class III to a Class I standpipe system in these occupancies.

Occupant-use hose stations are a legacy method of fire protection, going back for decades in model code requirements. In the past 20 years, many fire safety and evacuation plans have all but abandoned the use of occupant-use hose in their training to building occupants; relying on fire extinguisher training (which are required in all new and existing Group B and E occupancies) and the primary focus of evacuation. Also, fire behavior has changed dramatically in the past 30 years due to changes in compartment fire loading. This has created fires that develop faster, create more heat in most situations, and produce greater amount of toxic smoke. Collectively, the ability for occupants to safety and effectively utilize occupant-use hoses without the protection of firefighting gear and respiratory protection has been greatly minimized.

Occupant-use hose is already permitted to not be installed in sprinkler protected buildings that otherwise require standpipes. Even though this seems to be a trade-off by replacing a manual method with an automatic one, the determination of whether occupant-use hose should be based on the occupants ability to suppress a fire rather than the consideration of it as a trade-off. The Division of Building Standards and Codes regularly receives requests from building owners to remove existing occupant-use hose based on modern fire safety plans. All of these requests are supported by local fire officials as they do not see the benefit of the continued maintenance of such systems. Since the 1990's, the Division has supported the removal of occupant hoses in existing buildings either by code interpretation or variance.

The change is specific to Group B and E as these occupancies do not have a "3 story height" trigger for automatic sprinkler systems like other occupancies or address a specific condition like stages. Further, Group F and S occupancies have not been added as they may have a recognized fire brigade that utilize occupant-use hose for first response operations and are trained under OSHA 29 CFR 1910.156.

Cost Impact: Will not increase the cost of construction
The removal of the requirements for occupant-use hose will save on the cost of construction and maintenance of the hose systems.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The approval is based on the correlation with code change proposal F150-16 and the position that untrained occupants should not have or use Class III standpipes.

Assembly Action: **None**

Public Comments

Public Comment 1:

Daniel E Nichols, representing Self requests Approve as Modified by this Public Comment.

Modify as follows:

905.3.1 Height. Class III standpipe systems shall be installed throughout buildings where the floor level of the highest story is located more than 30 feet (9144 mm) above the lowest level of the fire department vehicle access, or where the floor level of the lowest story is located more than 30 feet (9144 mm) below the highest level of fire department vehicle access.

Exceptions:

1. Class I standpipes are allowed in buildings equipped throughout with an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2.
2. Class I standpipes are allowed in Group B and E occupancies.
3. Class I manual standpipes are allowed in open parking garages where the highest floor is located not more than 150 feet (45 720 mm) above the lowest level of fire department vehicle access.
4. Class I manual dry standpipes are allowed in open parking garages that are subject to freezing temperatures, provided that the hose connections are located as required for Class II standpipes in accordance with Section 905.5.
5. Class I standpipes are allowed in *basements* equipped throughout with an *automatic sprinkler system.*
6. Class I standpipes are allowed in buildings where occupant-use hose lines will not be utilized by trained personnel or the fire department.
7. In determining the lowest level of fire department vehicle access, it shall not be required to consider either of the following:
   7.1. Recessed loading docks for four vehicles or less.
   7.2. Conditions where topography makes access from the fire department vehicle to the building impractical or impossible.

Commenter's Reason: Commenter's Reason: This public comment is a correlation of F149 and F185. Both proposals had a common theme that occupant-use hose lines are not effective in occupancies where trained personnel is not present; regardless of other forms of fire protection.

F149 was approved as submitted, allowing the removal of occupant-use hose lines in all buildings, regardless of the new construction requirements of the IBC/IFC. The two items retained was whether the building had trained personnel and that the standpipes are compatible with fire department hose threads.

This public comment carries over the language from 901.8.2 into a new exception, stating that only a Class I standpipe system (FD use only) is required when the building occupants will not be trained to use the occupant-use hose lines.

Since the removal of the requirements to install occupant-use hose lines in all Group B and E was approved as submitted and many other occupancies are already covered because of the sprinkler threshold (see original reason statement) , the only place that a Class III standpipe is required is unsprinklered Group F-2, S-2, and U. This will allow the building owner and design team to determine the need for occupant-use hose lines in these 3 occupancies that are the lowest fire hazards of all of the occupancies, as well as align with the allowances already found in 901.8.2 and the position of the committee at the CAH.

Final Action Results

F185-16 **AMPC1**

Code Change No: F187-16

Original Proposal

Section: 905.4 (IBC [F] 905.4)

Proponent: Raymond Grill, Arup, representing self (ray.grill@arup.com)

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at ~~an intermediate~~ the main floor landing between stories, unless otherwise *approved* by the *fire code official*.
2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit* passageway, at the entrance from the exit passageway to other areas of a building.

   Exception: Where floor areas adjacent to an exit passageway are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit* passageway or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

Reason: This change is proposed in order to make the hose valve location requirements consitent with current requirements in NFPA 14. NFPA 14 requires hose valves to be located at the main floor landing.

Installation of hose valves at intermediate landings typically requires separate risers to be run for sprinklers and standpipes. This increases the cost and requires significantly more materials to achieve code compliance.

Cost Impact: Will not increase the cost of construction

This change will reduce the cost by not requiring the additional risers necessary to install hose outlets at intermediate landings.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below grade plane.
   2. Hose connections shall be located at the main floor landing ~~between stories~~, unless otherwise *approved* by the *fire code official*.
2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit* passageway, at the entrance from the exit passageway to other areas of a building.

   Exception: Where floor areas adjacent to an exit passageway are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit* passageway or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because the deleted text is unnecessary with the change in the location requirement.

Assembly Action **None**

Final Action Results

F187-16 **AM**

Code Change No: F188-16

Original Proposal

Section: 905.4, (IBC [F] 905.4)

Proponent: Jeffrey Shapiro, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com)

Revise as follows:

905.4 Location of Class I standpipe hose connections. Class I standpipe hose connections shall be provided in all of the following locations:

1. In every required *interior exit stairway*, a hose connection shall be provided for each story above and below grade plane. Hose connections shall be located at an intermediate landing between stories, unless otherwise *approved* by the *fire code official*.

   Exception: A single hose connection shall be permitted to be installed in the open corridor or open breezeway between open stairs that are not greater than 75 ft (22,860 mm) apart.

2. On each side of the wall adjacent to the *exit* opening of a horizontal *exit*.

   Exception: Where floor areas adjacent to a horizontal *exit* are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the horizontal *exit*.

3. In every *exit* passageway, at the entrance from the exit passageway to other areas of a building.

   Exception: Where floor areas adjacent to an exit passageway are reachable from an *interior exit stairway* hose connection by a 30-foot (9144 mm) hose stream from a nozzle attached to 100 feet (30 480 mm) of hose, a hose connection shall not be required at the entrance from the exit passageway to other areas of the building.

4. In covered mall buildings, adjacent to each exterior public entrance to the mall and adjacent to each entrance from an *exit* passageway or *exit corridor* to the mall. In open mall buildings, adjacent to each public entrance to the mall at the perimeter line and adjacent to each entrance from an exit passageway or exit corridor to the mall.
5. Where the roof has a slope less than four units vertical in 12 units horizontal (33.3-percent slope), a hose connection shall be located to serve the roof or at the highest landing of an *interior exit stairway* with access to the roof provided in accordance with Section 1011.12.
6. Where the most remote portion of a nonsprinklered floor or story is more than 150 feet (45 720 mm) from a hose connection or the most remote portion of a sprinklered floor or story is more than 200 feet (60 960 mm) from a hose connection, the *fire code official* is authorized to require that additional hose connections be provided in *approved* locations.

Reason: Correlation with NFPA 14-2016 Section 7.3.2.5. The provision recognizes that there is no significant value to having two standpipes located at opposite ends of an open breezeway or corridor that connects to open stairs since both standpipes are essentially sharing the same environmental space.

Cost Impact: Will not increase the cost of construction
The proposal will not increase the cost of construction. This is a clarification of the requirements of the current code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F188-16	**AS**

Code Change No: F190-16

Original Proposal

Section: 906.1 (IBC [F] 906.1)

Proponent: Jim Tidwell, Tidwell Code Consulting, representing Fire Equipment Manufacturers' Association (jimtidwell@tccfire.com)

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.

   ~~**Exception:** 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.~~

   Exceptions:

   1.1. 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.
   1.2. 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) of commercial cooking equipment.
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*.

Reason: Schools are now required to develop lock down plans to protect students and faculty from intruders. The plans effectively prevent access to portable extinguishers normally located in hallways during lockdown situations. Locating extinguishers in classrooms provides accessibility during normal conditions as well as when a school is forced into lockdown. This change provides an option for schools implementing lockdown plans to relocate extinguishers from hallways to classrooms. This is an option, not a requirement.

Cost Impact: Will not increase the cost of construction
This change will provide an option to schools, and is not a requirement; as such, the school management is empowered to make the best decision based upon their individual needs.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F190-16 **AS**

Code Change No: F192-16

Original Proposal

Section: 907.1.2 (IBC [F] 907.1.2) , 907.1.3 (New) (IBC [F] 907.1.3 (New))

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

Revise as follows:

907.1.2 Fire alarm shop drawings. Shop drawings for fire alarm systems shall be prepared in accordance with NFPA 72 and submitted for review and approval prior to system installation~~, and shall include, but not be limited to, all of the following where applicable to the system being installed:~~

~~1. A floor plan that indicates the use of all rooms.~~
~~2. Locations of alarm-initiating devices.~~
~~3. Locations of alarm notification appliances, including candela ratings for visible alarm notification appliances.~~
~~4. Design minimum audibility level for occupant notification.~~
~~5. Location of fire alarm control unit, transponders and notification power supplies.~~
~~6. Annunciators.~~
~~7. Power connection.~~
~~8. Battery calculations.~~
~~9. Conductor type and sizes.~~
~~10. Voltage drop calculations.~~
~~11. Manufacturers' data sheets indicating model numbers and listing information for equipment, devices and materials.~~
~~12. Details of ceiling height and construction.~~
~~13. The interface of fire safety control functions.~~
~~14. Classification of the supervising station.~~

Add new text as follows:

907.1.3 Document Access In accordance with NFPA 72, Operating, testing and maintenance instructions, record drawings ("as-builts"), equipment specifications, and a copy of site-specific software shall be provided in a document cabinet labeled "System Record Documents" at an approved location. The document cabinet shall be available for access only to authorized personnel.

Reason: NFPA 72 has enhanced the requirements for documentation and drawings/submittals. This code change will eliminate any conflicts and confusion by the referenced standard (NFPA 72) and IFC.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will not increase the cost of construction
There are no cost increases as this is what is already required in NFPA 72.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

~~**907.1.3 Document Access.** In accordance with NFPA 72, Operating, testing and maintenance instructions, record drawings ("as-builts"), equipment specifications, and a copy of site-specific software shall be provided in a document cabinet labeled "System Record Documents" at an approved location. The document cabinet shall be available for access only to authorized personnel.~~

Committee Reason: Approval is based upon the proponent's published reason for the revision to Section 907.1.2 only. The modification was approved because of the uncertainty and concern over the document storage and maintenance procedures.

Assembly Action **None**

Final Action Results

F192-16 **AM**

Code Change No: F194-16

Original Proposal

Section: 907.2.1 (IBC [F] 907.2.1)

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

Revise as follows:

907.2.1 Group A. A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where the occupant load due to the assembly occupancy is 300 or more, or where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Group A occupancies not separated from one another in accordance with Section 707.3.10 of the *International Building Code* shall be considered as a single occupancy for the purposes of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required for the Group E occupancy.

Exception: Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.

Reason: This change would serve to increase the fire alarm requirement where the A occupancy is located on a level other than that of exit discharge to be at least as strenuous as that of a B occupancy, which has the same 100 occupant load criteria for such.

Cost Impact: Will increase the cost of construction
This will increase the cost of construction where A occupancies meet the criteria established by the change.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason and that Group A occupants are less familiar with surroundings.

Assembly Action: **None**

Final Action Results

F194-16	**AS**

Code Change No: F196-16

Original Proposal

Section(s): 907.2.10 (IBC [F] 907.2.10), 907.2.10.1 (IBC [F] 907.2.10.1), 907.2.10.2 (IBC [F] 907.2.10.2), 1103.1, 1103.7.7; IBC [F] 420.6

Proponent: Carl Baldassarra, P.E., FSFPE, representing the Code Technology Committee (CTC@iccsafe.org)

2015 International Fire Code

Delete without substitution:

~~**907.2.10 Group R-4.** Fire alarm systems and smoke alarms shall be installed in Group R-4 occupancies as required in Sections 907.2.10.1 through 907.2.10.3.~~

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

~~**Exceptions:**~~

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

907.2.10.2 Automatic smoke detection system. An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in *corridors*, waiting areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens.

Exceptions:

1. Smoke detection in *habitable spaces* is not required where the facility is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.
2. An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an exit.

TABLE 1103.1
OCCUPANCY AND USE REQUIREMENTS[a]

SECTION	USE			OCCUPANCY CLASSIFICATION																	
	High-rise	Atrium or covered mall	Under-ground building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
1103.2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.3	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.4.1	R	—	R	—	—	—	—	—	—	—	—	—	—	R	R	—	—	—	—	—	—	—
1103.4.2	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	R	R
1103.4.3	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	R	R
1103.4.4	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.4.5	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—
1103.4.6	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.7	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.8	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	R	R	R
1103.4.9	R	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—

SECTION	USE			OCCUPANCY CLASSIFICATION																		
	High-rise	Atrium or covered mall	Under-ground building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
1103.5.1	—	—	—	R[c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.5.2, 1103.5.3 [b]	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.5.4	—	—	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.6.1	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R
1103.6.2	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R
1103.7.1	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.7.2	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—
1103.7.3	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.7.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—
1103.7.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—
1103.7.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—
~~1103.7.7~~	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	~~R~~	—
1103.8	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	R	R	R	R	—
1103.9	R	—	—	—	—	—	—	—	—	—	—	—	R	R	—	R	—	R	R	R	R	—
1104	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1105	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1106	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—

a. Existing buildings shall comply with the sections identified as "Required" (R) based on occupancy classification or use, or both, whichever is applicable.

b. Only applies to Group I-2 Condition 2 as established by the adopting ordinance.

c. Only applies to Group A-2 occupancies.

R = The building is required to comply.

~~1103.7.7 Group R-4.~~ ~~A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in existing Group R-4 residential care/assisted living facilities in accordance with Section 907.2.10.1.~~

~~**Exceptions:**~~

1. ~~Where there are interconnected smoke alarms meeting the requirements of Section 907.2.11 and there is not less than one manual fire alarm box per floor arranged to continuously sound the smoke alarms.~~
2. ~~Other manually activated, continuously sounding alarms approved by the fire code official.~~

2015 International Building Code

Revise as follows:

[F] 420.6 Fire alarm systems and smoke alarms. Fire alarm systems and smoke alarms shall be provided in Group I-1, R-1~~,~~ and R-2~~ and R-4~~ occupancies in accordance with Sections 907.2.6, 907.2.8~~,~~ and 907.2.9~~ and 907.2.10~~, respectively. Single- or multiple-station smoke alarms shall be provided in Groups I-1, R-2, R-3 and R-4 in accordance with Section 907.2.11.

2015 International Existing Building Code

Delete without substitution:

~~**804.4.1.7 Group R-4.** A fire alarm system shall be installed in work areas of Group R-4 residential care/ assisted living facilities as required by the International Fire Code for existing Group R-4 occupancies.~~

Reason: The requirements for a manual fire alarm system and an automatic smoke detection system in a facility with 16 or fewer residents is unwarranted. Such a system would not be required in an apartment building until there were at least 16 apartments – which is potentially many more people. Group R-4 is required to have single- and multiple- smoke alarms. Some of the language 'nurse's control stations' and 'constantly attended staff locations' is not applicable to group homes of this small size.
This is not an attempt to remove the requirement for single- and multiple- station smoke alarms in Section 907.2.11.2.
For correlation, the mandatory retrofit requirement for this system should also be deleted from the IFC Chapter 11 Construction Requirements for Existing Buildings and the reference to the same in the IEBC.

This proposal is submitted by the ICC Code Technology Committee (CTC). The ICC Board has decided to sunset the CTC. The sunset plan includes re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). The two remaining CTC Areas of Study are Care Facilities and Elevator Lobbies/WTC Elevator issues. This proposal falls under the Care Facilities Area of Study. In 2014 and 2015 ICC CTC Committee has held 4 open meetings and numerous Work Group meetings and conference calls for the current code development cycle which included members of the committees as well as any interested party to discuss and debate the proposed changes. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website CTC.

Cost Impact: Will not increase the cost of construction
This is a logical reduction in requirements.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: Disapproval was based upon the proponent's request to improve the proposal with a public comment.

Assembly Action: **None**

Public Comments

Public Comment 1:

Carl Baldassarra, P.E., FSFPE, representing Code Technologies Committee (CTC@iccsafe.org) requests Approve as Modified by this Public Comment.

Further modify as follows:

2015 International Fire Code

~~**907.2.10.2 Automatic smoke detection system.** An automatic smoke detection system that activates the occupant notification system in accordance with Section 907.5 shall be installed in *corridors*, waiting areas open to *corridors* and *habitable spaces* other than *sleeping units* and kitchens.~~

~~**Exceptions:**~~

1. ~~Smoke detection in *habitable spaces* is not required where the facility is equipped throughout with an *automatic sprinkler system* installed in accordance with Section 903.3.1.1.~~
2. ~~An automatic smoke detection system is not required in buildings that do not have interior *corridors* serving *sleeping units* and where each *sleeping unit* has a *means of egress* door opening directly to an *exit* or to an exterior *exit access* that leads directly to an exit.~~

~~**907.2.10.3 Smoke alarms.** Single and multiple station smoke alarms shall be installed in accordance with Section 907.2.11.~~

Commenter's Reason: The committee disapproved this proposal based on a request for CTC to further review the proposal. The intent remains the same - to allow for group homes with residents capable of self preservation to have an appropriate level of safety. To ask for a manual fire alarm system and an automatic smoke detection system for a facility with 16 or fewer residents is not warranted. These systems are required in apartment buildings with 16 or more apartments. Not only does that apartment building have significantly more residents, it consists of separate units. A Group R-4 facility is where the residents are effectively working together similar to a single family home. Section 907.2.10.3 is not needed because it is only a pointer to the requirement for single- and multiple-station smoke detectors required in Section 907.2.11.2. Therefore, this proposal asks for deletion of all of Section 907.2.10 through 907.2.10.3. The changes to the IFC Table 1103.1 and Section 1103.7.7, IBC Section 420.6 and IEBC 804.4.1.7 are strictly correlative.

Final Action Results

F196-16 **AMPC1**

Code Change No: F197-16

Original Proposal

Section(s): 907.2.13.3 (New) (IBC [F] 907.2.13.3 (New))

Proponent: Stephen DiGiovanni, Clark County Department of Building and Fire Prevention, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov)

Add new text as follows:

907.2.13.3 Multi-channel voice evacuation Voice evacuation systems for high-rise buildings shall be multi-channel systems.

Reason: It's common policy within jurisdictions for high-rise buildings to evacuate the floor of alarm, the floor above and the floor or floors below the alarm floor. A fire alarm system that has multiple channels allows one area of the building to receive an evacuation message, while other areas of the building can be given other instructions.

Cost Impact: Will increase the cost of construction
For those fire alarm notification systems that previously would have been allowed to be installed in high-rise buildings as a single-channel system, this code proposal will increase the cost of the fire alarm notification system

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee stated that a single channel system is sufficient and the need for a multi-channel system was not justified.

Assembly Action: **None**

Public Comments

Public Comment 1:

Stephen DiGiovanni, representing Southern Nevada Chapter of ICC (sdigiovanni@clarkcountynv.gov); James Gerren, representing Southern Nevada Chapter of ICC (JCG@ClarkCountyNV.gov) requests Approve as Modified by this Public Comment.

Modify as follows:

907.2.13.3 Multi-channel voice evacuation. ~~Voice~~ In buildings with an occupied floor more than 120 feet (36 576 mm) above the lowest level of fire department vehicle access, voice evacuation systems for high-rise buildings shall be multi-channel systems.

Commenter's Reason: During the testimony on F197-16, the committee stated that they felt a single channel system is sufficient and that a multi-channel system is an unwarranted cost increase. Single-channel systems are limited in that the emergency responders can only deliver one message at a time. A multi-channel system allows the emergency responders to deliver different live messages to various areas of the building at one time, which can lead to more detailed and more efficient emergency communications to the occupants. For example, if a fire occurs on the sixth floor of a high-rise building, a multi-channel system can be used by the emergency responders to direct the occupants of the fifth, sixth, and seventh floors to immediately egress via the nearest exit stairway, while at the same time separately informing the occupants of the eighth and higher levels of the situation and directing them to standby. This type of ability can help the emergency responders control the crowding within the exit stairways. Additionally, the benefits of the multi-channel system are not limited to fire evacuations only, as these systems can also be used effectively in active-shooter and other non-fire emergencies.

The proposed modification would make the requirement for multi-channel voice evacuation systems applicable to high-rise buildings only when the buildings have an occupied floor more than 120 feet above the lowest level of fire department vehicle access. The added language is consistent with (identical to) the language used in the requirement for fire service access elevators

in high-rise buildings found in IBC Section 403.6.1. This change to the proposal addresses hearing testimony, which expressed a concern that multi-channel systems may be useful for taller high-rise buildings but an unwarranted cost impact for smaller high-rise buildings (i.e., high-rise buildings that are only 8- to 12-stories in height).

Regarding the cost impact, multi-channel systems require the installation of a multi-channel audio controller, so there is a slight increase to the upfront cost of a multi-channel system. However, fire alarm risers for new systems today are digital and therefore do not require a dedicated second riser for a multi-channel system. The rest of the system infrastructure and equipment, including speakers and amplifiers, is required and provided whether or not the emergency voice/alarm communication system is single-channel or multi-channel. Therefore, the overall cost impact to configure an emergency voice/alarm communication system for multi-channel audio compared to a single-channel system is very minor.

Final Action Results

F197-16 **AMPC1**

Code Change No: F203-16

Original Proposal

Section: 907.3.2 (IBC: [F] 907.3.2)

Proponent: Michael O'Brian representing FCAC

Revise as follows:

907.3.2 ~~Delayed egress locks~~ Special locking systems. Where ~~delayed egress locks~~ special locking systems are installed on *means of egress* doors in accordance with ~~Section~~ Sections 1010.1.9.6,1010.1.9.7 or 1010.1.9.8, an automatic ~~smoke or heat~~ detection system shall be installed as required by that section.

Reason: Revising this section for correlation to "special locking systems" of Sections 1010.1.9.6 (Controlled egress doors in Groups I-1 and I-2), 1010.1.9.7 (Delayed egress), or 1010.1.9.8 (Sensor release of electrically locked egress doors) as each of these three sections for special locking systems require subsequent action by their locking system upon actuation of the automatic sprinkler system or automatic fire detection system. Also, deleting "smoke or heat" in this sentence as the specifics of the detection system does not need to be specified in this sentence.

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

Cost Impact: Will not increase the cost of construction
The revisions are correlative. No technical revisions intended.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

907.3.2 Special locking systems. Where special locking systems are installed on *means of egress* doors in accordance with Sections 1010.1.9.6 or, 1010.1.9.7 ~~or 1010.1.9.8~~, an automatic detection system shall be installed as required by that section.

Committee Reason: Approval is based upon the proponent's published reason with the exception of the addition of the Section 1010.1.9.8 reference. The modification was approved because of the concern with overexpansion of the section requirements and the potential for misinterpretation.

Assembly Action **None**

Final Action Results

F203-16	AM

Code Change No: F204-16

Original Proposal

Section: 907.4.2.1 (IBC [F] 907.4.2.1)

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

Revise as follows:

907.4.2.1 Location. Manual fire alarm boxes shall be located not more than 5 feet (1524 mm) from the entrance to each *exit*. In buildings not protected by an *automatic sprinkler system* in accordance with Section 903.3.1.1 or 903.3.1.2, additional manual fire alarm boxes shall be located so that the ~~*exit access*~~ distance of travel ~~distance~~ to the nearest box does not exceed 200 feet (60 960 mm).

Reason: This is a correction in terminology.

While fire alarm boxes may be located along the egress path, in the route measured as the exit access travel distance, the distance to the manual fire alarm boxes is not the "exit access travel distance".

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

Cost Impact: Will not increase the cost of construction
This is only a clarification issue and will not affect the cost of construction.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason in that it brings clarity to the required actual distance of travel requirement.

Assembly Action: **None**

Final Action Results

F204-16	**AS**

Code Change No: F206-16

Original Proposal

Section: 907.5.2.2.4 (IBC [F] 907.5.2.2.4)

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

Revise as follows:

907.5.2.2.4 Emergency voice/alarm communication captions. Where stadiums, arenas and grandstands ~~are required to caption~~ have 15,000 fixed seats or more and provide audible public announcements ~~in accordance with Section 1108.2.7.3 of the *International Building Code*~~, the emergency/voice alarm communication system shall ~~be captioned~~ also provide pre-recorded or real-time captions. Prerecorded or live emergency captions shall be from an *approved* location constantly attended by personnel trained to respond to an emergency.

Reason: This modification is proposing to add existing language from IBC Section 1108.2.7.3 to this section. This proposal correlates the access provisions with Chapter 9 by adding the scoping language. This proposal further affords the fire official, building official and other users of the code to design and enforce in accordance with Chapter 9 where both fire alarm and emergency voice alarm communication systems provisions are found. Additionally, the provisions that are contained in IBC 1108.2.7.3 have not been found in the US DOJ access guidelines. Jurisdictions that do not adopt IBC Chapter 11 and rely on the US DOJ access guidelines for accessibility are missing provisions as referenced in IBC/IFC 907.5.2.2.4. This proposal would correct this issue for those jurisdictions.

Cost Impact: Will not increase the cost of construction
This is a correlation of codes for better user design and enforcement.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F206-16	**AS**

Code Change No: F212-16

Original Proposal

Section: 907.5.2.3.2 (IBC [F] 907.5.2.3.2)

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

Revise as follows:

907.5.2.3.2 Groups I-1 and R-1. Habitable spaces in dwelling units and sleeping units in Group I-1 and R-1 ~~*dwelling units* or *sleeping units*~~ occupancies in accordance with Table 907.5.2.3.2 shall be provided with ~~a~~ visible alarm notification ~~appliance~~. Visible alarms shall be activated by ~~both~~ the in-room smoke alarm and the building fire alarm system.

Reason: This proposal is an attempt to clarify specifically where the visible notification appliances shall be located in newly constructed Group R-1 and I-1 dwelling and sleeping units and make sure that visible alarm notification is provided such that timely notification to guests with hearing impairments will occur.

This requirement will only affect those rooms identified as accessible. Table 907.5.2 already identifies the number of rooms which must be provided with visual notification. This proposal does not affect that number, but rather clarifies that the habitable space must be covered when installing the notification appliances.

Neither the 2010 ADA nor the 2016 NFPA 72 standard specify where visible notification appliances are to be located. The current IFC/IBC text could be interpreted to require only one device in a unit that has multiple habitable rooms. This code change provides a specific requirement that all habitable spaces shall be provided with visible notification so that there is no time delay in notifying guests with hearing impairments of a fire threat. To clarify this the term "appliance" was removed which is sometimes interpreted as only needing one appliance where more than one may be necessary. The term "habitable space" is defined in the IBC as follows:

"A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage or utility spaces and similar areas are not considered habitable spaces."

This definition specifically excludes toilet rooms, closets, halls, and storage and utility spaces from the required areas. This proposal clarifies that the visible alarm notification devices must cover habitable areas In some cases, this could be accomplished with one visible notification device depending on the floor plan of the sleeping unit. It should be noted that the intent of this requirement is that the visible alarm notification device have the ability to independently be initiated based upon the smoke alarm operation in the sleeping or dwelling unit or the building fire alarm.

Last code cycle a similar proposal (F172-13) was proposed but used the more ambiguous language "throughout the unit" instead of the specific language habitable spaces. This caused concern that all spaces including closets, halls and storage rooms could be considered required locations for installation of visible appliances. In response to that concern this revised language is proposed.

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

Cost Impact: Will increase the cost of construction
This provision has the potential to add an additional notification appliance however the intent was full visibility within the unit.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F212-16 **AS**

Code Change No: F213-16

Original Proposal

Section(s): 907.5.2.3.3 (IBC [F] 907.5.2.3.3)

Proponent: Thomas Hammerberg, Automatic Fire Alarm Association, representing Automatic Fire Alarm Association (tomhammerberg@afaa.org)

Revise as follows:

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all floors that contain *dwelling units* and *sleeping units* shall be provided with the future capability in fire alarm system power supply and circuits on each floor riser to support visible alarm notification appliances in accordance with Chapter 10 of ICC A117.1. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

Reason: This proposed change will save construction costs and provide clear direction for designers, owners and installers in R-2 buildings.

The code intent has not changed. There needs to be a capability to support visible fire alarm notification appliances in R-2 buildings when needed as the building evolves. What has been happening with the current language for "capability" is that some designers/code authorities took this to mean that you need to install conduit and wiring throughout a new building (into each dwelling unit) for possible future use. The identified intention was that the fire alarm system head end (power supplies, circuits, etc.) have a "capability" to support an additional visual appliances, not to have conduit and circuits run into each dwelling unit for some possible future use.

With this code change, the building will have the capability on EACH FLOOR to support additional visible appliances and will clarify the design.

Cost Impact: Will not increase the cost of construction
NONE. It will have an impact on saving construction costs as described above.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, all floors that contain *dwelling units* and *sleeping units* shall be provided with the future capability ~~in fire alarm system power supply and circuits on each floor riser~~ to support visible alarm notification appliances in accordance with Chapter 10 of ICC A117.1. Such capability shall be permitted to include the potential for future interconnection of the building fire alarm system with the unit smoke alarms, replacement of audible appliances with combination audible/visible appliances, or future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

Committee Reason: Approval is based upon the proponent's published reason. The modification was approved because it allows for new technology.

Assembly Action: **None**

Public Comments

Public Comment 2:

Jeffrey Shapiro, International Code Consultants, representing National Multifamily Housing Council (jeff.shapiro@intlcodeconsultants.com) requests Approve as Modified by this Public Comment.

Modify as follows:

907.5.2.3.3 Group R-2. In Group R-2 occupancies required by Section 907 to have a fire alarm system, ~~all floors~~ each *story* that ~~contain~~ contains *dwelling units* and *sleeping units* shall be provided with the future capability to support visible alarm notification appliances in accordance with Chapter ~~10~~11 of ICC A117.1.

Such capability shall be permitted to utilize wired or wireless equipment. The future capability shall be permitted to include:

1. the potential for future interconnection of the building fire alarm system with the unit smoke alarms,
2. replacement of audible appliances with combination audible/visible appliances, or
3. future extension of the existing wiring from the unit smoke alarm locations to required locations for visible appliances.

Commenter's Reason:

1. Changes the text to use the IBC defined term "story" rather than "floor."
2. Correlates with the change to A117.1-2015, which renumbered Chapter 10 to Chapter 11.
3. More specifically recognizes wireless equipment as the new technology mentioned in the committee reason statement for Approval as Modified.
4. Reformats the three existing options for providing future expansion capability as a list for clarity.

Final Action Results

F213-16 **AMPC2**

Code Change No: F216-16

Original Proposal

Section: 909.1 (IBC [F] 909.1, IMC [F] 513.1)

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

Revise as follows:

909.1 Scope and purpose. This section applies to mechanical or passive smoke control systems where they are required for new buildings or portions thereof by provisions of the *International Building Code* or this code. The purpose of this section is to establish minimum requirements for the design, installation and acceptance testing of smoke control systems that are intended to provide a tenable environment for the evacuation or relocation of occupants. These provisions are not intended for the preservation of contents, the timely restoration of operations or for assistance in fire suppression or overhaul activities. Smoke control systems regulated by this section serve a different purpose than the smoke and heat ~~venting~~ removal provisions found in Section 910. Mechanical smoke control systems shall not be considered exhaust systems under Chapter 5 of the *International Mechanical Code*.

Reason: This is strictly editorial. This code change provides correlation with the revision in IFC/IBC 910 where the terminology was revised in the 2015 edition.

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

Cost Impact: Will not increase the cost of construction
The revision is purely editorial and has no effect on the cost of construction. It will merely be consistent with the current language in Section 910.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F215-16	**AS**

Code Change No: F217-16 Part I

Original Proposal

Section: IFC: 909.5.3, 909.5.3.1, 1103.3.2 (IBC [F] 909.5.3, [F] 909.5.3.1)

Proponent: John Woestman, Kellen, representing Builders Hardware Manufacturers Association (jwoestman@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

Revise as follows:

909.5.3 Opening protection. Openings in *smoke barriers* shall be protected by automatic-closing devices actuated by the required controls for the mechanical smoke control system. Door openings shall be protected by fire door assemblies complying with Section ~~716.5.3~~ 716 of the *International Building Code*.

Exceptions:

1. Passive smoke control systems with automatic-closing devices actuated by spot-type smoke detectors *listed* for releasing service installed in accordance with Section 907.3.
2. Fixed openings between smoke zones that are protected utilizing the airflow method.
3. In Group I-1 Condition 2, Group I-2 and ambulatory care facilities, where a pair of opposite-swinging doors are installed across a corridor in accordance with Section 909.5.3.1, the doors shall not be required to be protected in accordance with Section 716 of the *International Building Code*. The doors shall be close-fitting within operational tolerances and shall not have a center mullion or undercuts in excess of $^{3}/_{4}$ inch (19.1 mm) louvers or grilles. The doors shall have head and jamb stops and astragals or rabbets at meeting edges and, where permitted by the door manufacturer's listing, positive-latching devices are not required.
4. In Group I-2 and ambulatory care facilities, where such doors are special-purpose horizontal sliding, accordion or folding door assemblies installed in accordance with Section 1010.1.4.3 and are automatic closing by smoke detection in accordance with Section ~~716.5.9.3~~ 716.2.6.5 of the *International Building Code*.
5. Group I-3.
6. Openings between smoke zones with clear ceiling heights of 14 feet (4267 mm) or greater and bank-down capacity of greater than 20 minutes as determined by the design fire size.

909.5.3.1 Group I-1 Condition 2, Group I-2 and ambulatory care facilities. In Group I-1 Condition 2, Group I-2 and *ambulatory care facilities*, where doors are installed across a *corridor*, the doors shall be automatic closing by smoke detection in accordance with Section ~~716.5.9.3~~ 716.2.6.5 of the *International Building Code* and shall have a vision panel with fire protection rated glazing materials in fire protection rated frames, the area of which shall not exceed that tested.

1103.3.2 Elevator emergency operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more above or below the main floor or other level of a building and intended to serve the needs of emergency personnel for fire-fighting or rescue purposes shall be provided with emergency operation in accordance with ASME A17.3.

Exceptions:

1. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where protected at the elevator shaft openings with additional fire doors in accordance with Section ~~716.5~~716 of the *International Building Code* and where all of the following conditions are met:
   1.1. The doors shall be provided with vision panels of approved fire protection-rated glazing so located as to furnish clear vision of the approach to the elevator. Such glazing shall not exceed 100 square inches (0.065 m^2) in area.
   1.2. The doors shall be held open but be automatic-closing by activation of a fire alarm initiating device installed in accordance with the requirements of NFPA 72 as for Phase I Emergency Recall Operation, and shall be located at each floor served by the elevator; in the associated elevator machine room, control space, or control room; and in the elevator hoistway, where sprinklers are located in those hoistways.
   1.3. The doors, when closed, shall have signs visible from the approach area stating: WHEN THESE DOORS ARE CLOSED OR IN FIRE EMERGENCY, DO NOT USE ELEVATOR. USE EXIT STAIRWAYS.
2. Buildings without occupied floors located more than 55 feet (16 764 mm) above or 25 feet (7620 mm) below the lowest level of fire department vehicle access where provided with *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2.
3. Freight elevators in buildings provided with both *automatic sprinkler systems* installed in accordance with Section 903.3.1.1 or 903.3.1.2 and not less than one ASME 17.3-compliant elevator serving the same floors.

Elimination of previously installed Phase I emergency recall or Phase II emergency in-car systems shall not be permitted.

Reason: This proposal complements FS74-15 approved in 2015 which reviewed all Group A I-Code references that "point" to IBC Section 716 and / or to subsection(s) of IBC 716, and revised several of the pointers. With proposal FS101-15 approved last year which completely reorganized IBC Section 716, the pointers in Group B code sections need to be reviewed and several revised. In most locations, the references to a subsection of IBC 716 many need only an editorial update to the new location of the references requirements based on the reorganized text.

Cost Impact: Will not increase the cost of construction
There should be no cost increase. The proposed revisions should be consistent with the intent of the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F217-16 Part I **AS**

Code Change No: F217-16 Part II

Original Proposal

Section: IECC: C402.5.4.

Proponent: John Woestman, Kellen, representing Builders Hardware Manufacturers Association (jwoestman@kellencompany.com)

THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE FIRE CODE COMMITTEE. PART II WILL BE HEARD BY THE IECC-COMMERCIAL CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THESE COMMITTEES.

Revise as follows:

C402.5.4 Doors and access openings to shafts, chutes, stairways and elevator lobbies. Doors and access openings from conditioned space to shafts, chutes stairways and elevator lobbies not within the scope of the fenestration assemblies covered by Section C402.5.2 shall be gasketed, weatherstripped or sealed.

Exceptions:

1. Door openings required to comply with Section 716 ~~or 716.5~~ of the *International Building Code.*
2. Doors and door openings required to comply with UL 1784 by the *International Building Code*.

Reason: This proposal complements FS74-15 approved in 2015 which reviewed all Group A I-Code references that "point" to IBC Section 716 and / or to subsection(s) of IBC 716, and revised several of the pointers. With proposal FS101-15 approved last year which completely reorganized IBC Section 716, the pointers in Group B code sections need to be reviewed and several revised. In most locations, the references to a subsection of IBC 716 many need only an editorial update to the new location of the references requirements based on the reorganized text.

Cost Impact: Will not increase the cost of construction
There should be no cost increase. The proposed revisions should be consistent with the intent of the code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F217-16 Part II **AS**

Code Change No: F218-16

Original Proposal

Section: 909.6.1 (IBC: [F] 909.6.1)

Proponent: Victor Cuevas, representing City of Los Angeles

Revise as follows:

909.6.1 Minimum pressure difference. The ~~minimum~~ pressure difference across a *smoke barrier* used to separate smoke zones shall be not less than 0.05-inch water gage (0.0124 kPa) in fully sprinklered buildings.

In buildings ~~allowed~~ permitted to be other than fully sprinklered, the smoke control system shall be designed to achieve pressure differences not less than two times the maximum calculated pressure difference produced by the design fire.

Reason: This change is intended to address the fact that smoke barriers can exist within a single smoke zone, which may be comprised of active and passive sub-zones. A 0.05 inch pressure differential is intended to contain smoke within the smoke zone of origin when that smoke zone is pressurized or depressurized. When a smoke barrier is provided within a smoke zone to separate passive areas from actively pressurized (or depressurized) areas, the intent is not to maintain a 0.05 inch pressure differential across those barriers. This is not always possible, due to impacts on door opening forces.

Cost Impact: Will not increase the cost of construction
The code change proposal will not increase the cost of construction. This is a clarification of the requirements of the current code.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F218-16	**AS**

Code Change No: F221-16

Original Proposal

Section(s): 912.2 (IBC [F] 912.2), 912.2.1 (IBC [F] 912.2.1)

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

Revise as follows:

912.2 Location. ~~With respect to hydrants, driveways, buildings and landscaping, fire~~ Fire department connections shall be ~~so located~~ installed in an approved location that is adjacent to and clearly visible from a street or fire apparatus ~~and~~ access road. A position for fire apparatus supplying the fire department connection shall be identified on construction plans in accordance with Section 501.3. A direct hose ~~connected~~ lay path from that position to ~~supply~~ the fire department connection shall be provided and shall comply with both of the ~~system will~~ following:

1. The hose-lay path shall not be obstructed by landscaping, walls, fences or other impediments.
2. The hose-lay path shall not obstruct access ~~to the buildings for~~ by other fire apparatus. ~~The location of fire department connections shall be approved by the fire chief.~~

Delete without substitution:

~~**912.2.1 Visible location.** Fire department connections shall be located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire chief.~~

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

Bibliography: This provides flexibility for designers.

Cost Impact: Will increase the cost of construction
May increase the cost of construction due to clarification of the requirement to provide an unobstructed pathway between fire apparatus and a fire department connection. Although this was implicit in the prior code text, the clarifications provided by this change eliminate the chance for subjective interpretation of the provisions.

Report of Committee Action Hearings

Committee Action: **Disapproved**

Committee Reason: The committee stated that the requirements belong in Chapter 5 and that the provisions would be difficult to determine and enforce.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Replace Proposal as follows:

912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall be so located that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be *approved* by the fire chief.

912.2.1 Visible location. Fire department connections shall be located on the street side of buildings or facing approved fire apparatus access roads, fully visible and recognizable from the street, fire apparatus access road or nearest point of fire department vehicle access or as otherwise *approved* by the fire chief.

Commenter's Reason:
The previous code proposal attempted to consolidate two sections into one, and to update wording for a technical reason and for clarity. From the committee responses it was clear that the changes made the code section less clear. This public comment goes back to the current code language, and keeps the two sections separate. A technical change is again proposed, which allows for a fire department connection to be located on any side of the building that faces an approved fire apparatus access road. The current code only allows the fire department connection on the street side of the building, but there are sites where it is advantageous to have the fire department connection on another side of the building. This proposal permits that flexibility, as long as the fire department connection faces an approved fire apparatus access road.

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

Final Action Results

F221-16 **AMPC1**

Code Change No: F224-16

Original Proposal

Section: 915.1.3, 915.1.4, 915.1.5, 915.2.3, 915.3, 915.4.3 (New), 915.4.3 (IBC [F] 915.1.3, [F] 915.1.4, [F] 915.1.5, [F] 915.2.3, [F] 915.3, [F] 915.4.3 (New), [F] 915.4.3)

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

Revise as follows:

915.1.3 ~~Forced-air~~ Fuel burning forced-air furnaces. Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms served by a fuel-burning, forced-air furnace.

Exception: Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide ~~detection~~ detector is provided in the first room or area served by each main duct leaving the furnace, and the carbon monoxide alarm signals are automatically transmitted to an approved location.

915.1.4 Fuel-burning appliances outside of dwelling units, sleeping units and classrooms. Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms located in buildings that contain fuel-burning appliances or fuel-burning fireplaces.

Exceptions:

1. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where there are no communicating openings between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms where a carbon monoxide ~~detection~~ detector is provided in one of the following locations:
   2.1. In an approved location between the fuel-burning appliance or fuel-burning fireplace and the *dwelling unit*, *sleeping unit* or classroom.
   2.2. On the ceiling of the room containing the fuel-burning appliance or fuel burning fireplace.

915.1.5 Private garages. Carbon monoxide detection shall be provided in *dwelling units*, *sleeping units* and classrooms in buildings with attached private garages.

Exceptions:

1. Carbon monoxide detection shall not be required where there are no communicating openings between the private garage and the *dwelling unit*, *sleeping unit* or classroom.
2. Carbon monoxide detection shall not be required in *dwelling units*, *sleeping units* and classrooms located more than one story above or below a private garage.
3. Carbon monoxide detection shall not be required where the private garage connects to the building through an open-ended corridor.

~~4. Where carbon monoxide detection is provided in an approved location between openings to a private garage and *dwelling units*, *sleeping units* or classrooms, carbon monoxide detection shall not be required in the *dwelling units*, *sleeping units* or classrooms.~~

4. Where a carbon monoxide detector is provided in an approved location between openings to a private garage and *dwelling units*, *sleeping units* or classrooms.

915.2.3 Group E occupancies. Carbon monoxide ~~detection~~ detectors shall be installed in classrooms in Group E occupancies. Carbon monoxide alarm signals shall be automatically transmitted to an on-site location that is staffed by school personnel.

> **Exception:** Carbon monoxide alarm signals shall not be required to be automatically transmitted to an on-site location that is staffed by school personnel in Group E occupancies with an occupant load of 30 or less.

915.3 ~~Detection equipment~~ Carbon monoxide detection. *No change to text.*

Add new text as follows:

915.4.3 Locations. Carbon monoxide alarms shall only be installed in dwelling units and in sleeping units. They shall not be installed in locations where the Code requires carbon monoxide detectors to be used.

Revise as follows:

~~915.4.3~~ 915.4.4 Combination alarms. *No change to text.*

Reason: This proposal clarifies the locations where carbon monoxide alarms can be used in accordance with their listings, which is in dwelling units and sleeping rooms. It also clarifies the applications where carbon monoxide detectors must be used, which includes locations other than dwelling units and sleeping units, and in locations where detection is required in a location that may be remote from occupied areas being protected.

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

Cost Impact: Will not increase the cost of construction
This proposal merely clarifies the applications that require a carbon monoxide detector be provided, as part of a carbon monoxide detection system. This provides correlation with the applications for which carbon monoxide detection equipment is listed.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: Approval is based upon the proponent's published reason.

Assembly Action: **None**

Final Action Results

F224-16 **AS**

F224-16

SECTION 915
CARBON MONOXIDE DETECTION
RESERVED

Code Change No: F226-16

Original Proposal

Section(s): 916 (New) (IBC [F] 916)

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

Add new text as follows:

SECTION 916
GAS DETECTION SYSTEMS

916.1 Gas detection system activation. Where a gas detection system is required elsewhere in this code, a gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring gas detection.

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

Reason: This proposal is a companion change to the FCAC proposal that adds a new Section 916 on gas detection systems. It adds a baseline detection threshold of 1/2 IDLH for non-flammable gases that require gas detection under other code sections, should a detection threshold not otherwise be specified by such sections. IDLH is a concentration that would allow an exposed individual 30 minutes to self evacuate, so half of that concentration is a conservative threshold for initiating an evacuation alarm associated with the risk of a pending acute hazard. Specifying this value will also make it clear that it is not the intent of the IFC to begin broadly regulating non-flammable gases that have no other IFC/IBC regulated physical or health hazard characteristics based on chronic exposures in a work environment (i.e. PEL or TLV/TWA values). That is the purview of OSHA, not the fire code.

Cost Impact: Will not increase the cost of construction
This proposal does not add additional construction requirements.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: This proposal was approved as it was consistent with code change proposal F75-16.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

~~**916.1**~~ **916.8** ~~**Gas detection system**~~ **System activation.** ~~Where a gas detection system is required elsewhere in this code, a~~ A gas detection alarm shall be initiated when any sensor detects a concentration of gas exceeding the following thresholds:

1. For flammable gases, a gas concentration exceeding 25 percent of the lower flammable limit (LFL).
2. For non-flammable gases, a gas concentration exceeding 1/2 of the IDLH, unless a different threshold is specified by the section of this code requiring a *gas detection system*.

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

Commenter's Reason: The proposed modifications are for correlation with the section numbering and terminology used in Code Change F75-16, which was recommended for Approval as Submitted by the IFC Code Development Committee. This code change will modify Section 916.8 in F75-16 to specify that the alarm activation threshold for a non-flammable gas will be 1/2 of the IDLH value unless the section of the code requiring gas detection specifies a different value, which is typically the case. This comment should be considered after any comments to F75-16.

Analysis: Note that if F75-16 is disapproved this PC would no longer be necessary.

Final Action Results

F226-16 **AMPC1**

Code Change No: F228-16

Original Proposal

Section(s): 202, 202 (New),105.7.5 (New), 916 (New), 916.1 (New), 916.2 (New), 916.3 (New), 916.3.1 (New), 916.4 (New), 916.5 (New) (IBC [F] 202, [F] 916 (New), [F] 916.1 (New), [F] 916.2 (New), [F] 916.3 (New), [F] 916.3.1 (New), [F] 916.4 (New), [F] 916.5 (New))

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

EMERGENCY VOICE/ALARM COMMUNICATIONS. Dedicated manual or automatic facilities for originating and distributing voice instructions, as well as alert and evacuation signals pertaining to a fire emergency, to the occupants of a building.

Add new definition as follows:

EMERGENCY COMMUNICATION SYSTEM. A system for the protection of life and property by indicating the existence of an emergency situation and communicating information necessary to facilitate an appropriate response and action.

EMERGENCY RESPONSE PLAN. A documented set of actions to address the planning for, management of, and response to natural, technological, and man-made disasters and other emergencies. Examples include but not limited to fire safety, evacuation and lockdown plans.

Add new text as follows:

105.7.5 Emergency communication system. A construction permit is required for installation of or modification to emergency communication systems and related equipment. Maintenance performed in accordance with this code is not considered to be a modification and does not require a construction permit.

SECTION 916
EMERGENCY COMMUNICATION SYSTEMS

916.1 Mass Notification An approved Emergency Communication System incorporating mass notification shall be provided for the following occupancies when required by a Risk Analysis prepared in accordance with 916.3. The emergency communication system shall comply with Sections 916.2 through 916.5.

Required Occupancies:

1. New Group E occupancies
2. New college-university Group B occupancies
3. New college-university Group A occupancies
4. New college-university Group R-2 occupancies operated by a college or university for student or staff housing

   Exception: Occupancies with an occupant load of 100 or less.

916.2 Permit Construction permit shall be required to install emergency communication systems as set forth in Section 105.7.5.

916.3 Risk Analysis A risk analysis and the emergency communication provisions of mass notification and emergency response plan shall be in accordance with NFPA 72, Section 24.3.11.

916.3.1 Approval. A risk analysis shall be submitted to the Fire Code Official for approval.

916.4 System design. Emergency communication systems shall be selected and designed based upon the completed emergency response plan, and input provided by the school administration, law enforcement agencies responsible for the facility and the fire code official.

916.5 Installation, testing and maintenance. Emergency communication systems shall be installed, tested and maintained in accordance NFPA 72 and applicable requirements in this code.

Reason: The need for real-time effective emergency communications in the United States came into sharp focus in the 20th century in response to threats to homeland security and our educational occupancies. We have learned from the recent incidents that occurred in our college/university campuses and other buildings, and have created installation guidelines to be followed for Life Safety. [Aurora, CO. Theater 2012; Columbine 1999; Virginia Tech 2007; Sandy Hook 2012; Weather Tornadoes/Storms]]

There are no national code requirements for these systems. That is causing issues with owners that understand they need improved emergency communications to the masses, and are taking steps that they think may be of value, but in some cases are not due to lack of codes and standards enforcement.

This mission was presented to the FCAC by the CCFS Center for Campus Fire Safety; their survey and research of their national membership showed the need for codes in this area for educational/college/university applications. This is considered a very important first step in Life Safety in these areas.

This code change proposal provides a requirement that a Risk Analysis and an Emergency Response Plan be created for every new educational occupancy and every new A, B occupancy for colleges and universities and new R-2 -occupancies operated by a college or university for student or staff housing.

If the completed Risk Analysis indicates that an Emergency Communication System is warranted for the occupancy, this proposal then provides a process for obtaining a permit from the fire code official and refers to NFPA 72 for system installation and maintenance.

When a mass disaster event occurs, and they are occurring, the need for real time information communicated in a clear and concise method via various paths is very critical to Life Safety. The Risk Analysis and the Emergency Response Plan have been shown to be the needed steps to take in this complicated life safety concern today and in the future.
NFPA 72 National Fire Alarm and Signaling Code has a chapter dedicated to Emergency Communication Systems. The information/requirements for Risk Analysis and qualifications for those performing these services are within NFPA 72; they are matured and are in the 3rd cycle of revisions.

This is NOT intended to require a Mass Notification System in every educational occupancy. There are many elements contained within a Mass Notification System, the process of the Risk Analysis will outline what is needed based on Risk and engineering study for the occupancy. It will be the responsibility of the engineer/designer of the education occupancy to perform and then react to the Risk Analysis.

There are some new terms being introduced and the industry is evolving. The proposed definitions are intended to assist the reader and code enforcer. ECS-Emergency Communication Systems are the major/overall classification. It covers One Way, Two Way, Wide Area (outside) In-Building Mass Notification and Distributed Recipient (Cell phone, laptop) forms of communication. All of this is covered in detail in NFPA 72. Mass Notification is a subset of ECS for all hazards concerns. Another is EVACS which is the Em Voice Alarm Communication System which is defined for FIRE incidents, and now can be utilized for mass notification.
This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014 and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will increase the cost of construction
The cost for conducting a Risk Analysis would range from $5,000 to $15,000 per building depending on complexity.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: The committee had concern over the risk analysis requirement, the application for Group B occupancies, and the location and ownership of campus buildings. The proposal as submitted has too many flaws and has the potential for misapplication.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Replace proposal as follows:

SECTION 916
MASS NOTIFICATION SYSTEMS

916.1 College and University Campuses. Prior to construction of a new building requiring a fire alarm system on a multi-building college or university campus having a cumulative building occupant load of 1,000 or more, a mass notification risk analysis shall be conducted in accordance with NFPA 72. Where the risk analysis determines a need for mass notification, an approved mass notification system shall be provided in accordance with the findings of the risk analysis.

Commenter's Reason: F228 was disapproved by the Fire Safety Committee at the Louisville Hearings. It lost by a very close margin, and we requested an Assembly Action which allowed all of the ICC membership to vote online on this code change. The results are 76.1% SUPPORT of the original proposal and 23.9% oppose the original proposal. This shows there is significant interest and support for this concept.

Over a dozen stakeholders, life safety experts and code officials have worked to reduce the scope of this code change proposal and provide the above language that will provide life safety benefit to our nations educational campuses.

This mission was originally presented to the FCAC by the CCFS Center for Campus Fire Safety; their survey and research of their national membership showed the need for codes in this area for higher education campus operations.

The need for real-time effective emergency communications in the United States came into sharp focus in the 20th century in response to threats to homeland security and our educational occupancies. We have learned from the recent incidents that occurred in our college/university campuses and other buildings, and have created installation guidelines to be followed for Life Safety. [Aurora, CO. Theater 2012; Columbine 1999; Virginia Tech 2007; Sandy Hook 2012; Weather Tornadoes/Storms]]

When a mass disaster event occurs, and they are occurring, the need for real time information communicated in a clear and concise method via various paths is very critical to Life Safety. The Risk Analysis and the Emergency Response Plan have been shown to be the needed steps to take in this complicated life safety concern today and in the future.

There are no national code requirements for these systems. That is causing issues with owners that understand they need improved emergency communications to the masses, and are taking steps that they think may be of value, but in some cases are not due to lack of codes and standards enforcement.

This action will NOT require a mass notification system to be installed; it requires the Risk Analysis which is outlined in detail within NFPA 72. That analysis prepared by a registered design professional along with stakeholders of the college and AHJ that will outline what is needed for this location and application.

This code change proposal provides a requirement that a Risk Analysis be created for every new building of size that requires a fire alarm system in college's campuses. This trigger was included so that not any new building would be affected, just those that have already been shown to need a level a life safety..

NFPA 72 National Fire Alarm and Signaling Code has a chapter dedicated to Emergency Communication Systems-Mass Notification. The information/requirements for Risk Analysis and qualifications for those performing these services are within NFPA 72; they are matured and are in the 3rd cycle of revisions.

Mass Notification can cover One Way, Two Way, Wide Area (outside) In-Building Mass Notification and Distributed Recipient (Cell phone, laptop) forms of communication. All of this is covered in detail in NFPA 72. Mass Notification is a subset of ECS for all hazards concerns. Another is EVACS which is the Em Voice Alarm Communication System which is defined for FIRE incidents, and now can be utilized for mass notification.

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

Final Action Results

F228-16 **AMPC1**

Code Change No: F238-16

Original Proposal

Section: Table 903.2.11.6 (IBC: [F]Table 903.2.11.6), Table 1103.1, 1103.5.1 (New)

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

Add new text as follows:

1103.5.1 Group A-2. Where alcoholic beverages are consumed in a Group A-2 occupancy having an occupant load of 300 or more, the fire area containing the Group A-2 occupancy shall be equipped with an *automatic sprinkler system* in accordance with Section 903.3.1.1.

TABLE 1103.1
OCCUPANCY AND USE REQUIREMENTS[a]

SECTION	USE			OCCUPANCY CLASSIFICATION																	
	High-rise	Atrium or covered mall	Under-ground building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
1103.2	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.3	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.4.1	R	—	R	—	—	—	—	—	—	—	—	—	—	R	R	—	—	—	—	—	—	—
1103.4.2	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	R	R
1103.4.3	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	—	R	R
1103.4.4	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.4.5	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—
1103.4.6	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.7	—	—	—	R	—	R	R	R	R	R	R	R	R	R	R	R	—	R	R	R	R	R
1103.4.8	R	—	R	R	R	R	R	R	R	R	R	R	R	—	—	R	R	R	R	R	R	R
1103.4.9	R	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.5.1	—	—	—	R[c]	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.5.2, 1103.5.3[b]	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.5.4	—	—	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1103.6.1	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	R	R
1103.6.2	R	—	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	—	R	R
1103.7.1	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1103.7.2	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—	—
1103.7.3	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1103.7.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—
1103.7.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—
1103.7.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—
1103.7.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—
1103.8	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	R	R	R	R	—

SECTION	USE			OCCUPANCY CLASSIFICATION																	
	High-rise	Atrium or covered mall	Under-ground building	A	B	E	F	H-1	H-2	H-3	H-4	H-5	I-1	I-2	I-3	I-4	M	R-1	R-2	R-3	R-4	S
1103.9	R	—	—	—	—	—	—	—	—	—	—	—	R	R	—	R	—	R	R	R	R	—
1104	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
1105	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—
1106	—	—	—	—	—	—	—	—	—	—	—	—	—	R	—	—	—	—	—	—	—	—

a. Existing buildings shall comply with the sections identified as "Required" (R) based on occupancy classification or use, or both, whichever is applicable.

b. Only applies to Group I-2 Condition 2 as established by the adopting ordinance.

c. Only applies to Group A-2 occupancies where alcoholic beverages are consumed.

R = The building is required to comply.

TABLE 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
1103.5.2	Pyroxylin plastic storage in existing buildings
1103.5.1	Existing Group A-2 occupancies
1103.5.3	Existing Group I-2 occupancies
1103.5.4	Existing Group I-2 Condition 2 occupancies
1103.5.4	Pyroxylin plastics
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

SECTION	SUBJECT
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
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 warehouses

For SI: 1 cubic foot = 0.023 m^3.

Reason: This requirement implements the Recommendation #1 included in the NIST Report of the Technical Investigation of The Station Nightclub Fire (NIST NCSTAR 2: Vol. I). Recommendation 1 of the NIST report states: "Model codes should require sprinkler systems for all new and existing nightclubs regardless of size."

Group A-2 occupancies involve conditions such as large occupant loads, high occupant density, significant fuel loading and moveable furnishings and decorations. Group A-2 occupancies also include the potential for reduced lighting levels, high noise levels, combustible decorations, strobe and flashing lights, alcohol consumption, and confusing egress paths. Each of these alone can be a significant issue, but when combined they lead to the inability of the occupants to promptly and safely exit the building under fire conditions.

This proposal does not reach as far as the recommendation from NIST. While the NIST proposal recommends fire sprinklers in ALL facilities, the proposed section requires the Group A-2 occupancy fire area where alcoholic drinks are consumed in excess of 300 occupants be provided with a fire sprinkler system. The section does not require the other fire areas that may be in the A-2 to be protected, nor does it require the entire floor to be protected. Setting the threshold at 300 occupants will place the requirement where the higher potential for loss of life exists.

The sprinkler retrofit requirement has been targeted to only apply to Group A-2 occupancies that serve alcoholic beverages. This is felt to be more in line with the NIST recommendations that were made following the Station Nightclub fire recognizing that intoxication of patrons plays a significant role in the potential risk of injury or loss of life in the event of a fire. In addition, limiting the scope of the change to only those occupancies where alcoholic beverages are consumed, allows a connection to licensing laws that jurisdictions typically have in place for sale of such beverages. Such licensing laws, where they apply, will provide significant leverage for jurisdictions to be able to effectively enforce the requirement for a fire sprinkler system as a condition of being code compliant and issuance of a license.

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

Cost Impact: Will increase the cost of construction
Adding a fire sprinkler system in an existing A-2 occupancy that serves alcohol will change the business plan of the owner. Investing into a fire sprinkler system in the long term will benefit the owner by protecting the investment, property, and life safety of the patrons, as well as reduce the liability to the owner and insurance premiums.

Staff Note: There is a published errata that has deleted the text for Section 1103.5.1 in the first printing of IFC, and the associated line in Table 1103.1. The text was as follows:

> **1103.5.1 Group A-2.** An automatic sprinkler system shall be installed in accordance with Section 903.3.1.1 through-out existing buildings or portions thereof used as Group A-2 occupancies with an occupant load of 300 or more.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee approved this proposal based upon previous action in the 2013 cycle and the fact that they provided a more reasonable threshold of 300 versus that required for new construction of 100.

Assembly Action: **None**

Final Action Results

F328-16 **AS**

Code Change No: F258-16

Original Proposal

Section(s): 2201.1, 2203.1 (New), 2203.2 (New), 2203.1, 2203.2, 2204, 2204.1; IBC 426.1

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

2015 International Fire Code

Revise as follows:

2201.1 Scope. The equipment, processes and operations involving dust explosion hazards shall comply with the provisions of this ~~chapter~~ code and NFPA 652.

2201.2 Permits. Permits shall be required for *combustible dust*-producing operations as set forth in Section 105.6.

SECTION 2203
PRECAUTIONS

Add new text as follows:

2203.1 Owner responsibility. The owner or operator of a facility with operations that manufacture, process, blend, convey, repackage, generate, or handle potentially combustible dusts or combustible particulate solids shall be responsible for compliance with the provisions of this code and NFPA 652.

2203.2 Dust hazard analysis (DHA). The requirements of NFPA 652 apply to all new and existing facilities and operations with potentially combustible dust. Existing facilities shall have a Dust Hazards Analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.

The fire code official shall order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis.

Revise as follows:

~~2203.1~~ 2203.3 Sources of ignition. *No change to text.*

~~2203.2~~ 2203.4 Housekeeping. *No change to text.*

SECTION 2204
~~EXPLOSION PROTECTION~~ ADDITIONAL REQUIREMENTS

2204.1 ~~Standards~~ Specific hazards standards. The ~~fire code official is authorized to enforce applicable provisions of~~ the industry- or commodity-specific codes and standards listed in Table 2204.1 ~~to prevent~~ shall be complied with based upon the identification and ~~control dust explosions~~ evaluation of the specific fire and deflagration hazards that potentially exist at a facility.

TABLE 2204.1
EXPLOSION PROTECTION 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

2015 International Building Code

CHAPTER 4
SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

SECTION [F] 426
COMBUSTIBLE DUSTS, GRAIN PROCESSING AND STORAGE

426.1 Combustible dusts, grain processing and storage. The provisions of Sections 426.1.1 through 426.1.7 shall apply to buildings in which materials that produce combustible dusts are stored or handled. Buildings that store or handle combustible dusts shall comply with NFPA 652 and the applicable provisions of NFPA 61, NFPA 85, NFPA 120, NFPA 484, NFPA 654, NFPA 655 and NFPA 664 and the *International Fire Code*.

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

Add the standard to both the IFC and the IBC

NFPA 652 - 2016 THE FUNDAMENTALS OF COMBUSTIBLE DUST

http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=652

Reason: NFPA has developed a new dust standard, , NFPA 652 THE FUNDAMENTALS OF COMBUSTIBLE DUST, to serve as the fundamental standard for assessing the hazard of combustible dusts or particulates at a facility and the conducting of a dust hazard analysis to quantify the hazard and identify remedial actions and protections levels. The purpose of this proposal is to add NFPA 652 to both the IFC and IBC as the lead standard to apply to potential dust hazards.

Cost Impact: Will not increase the cost of construction
For facilities already in compliance with current standards of care there should be no increase in cost.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 652 - 2016 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 1, 2016.

Report of Committee Action Hearings

Committee Action: **As Submitted**

Committee Reason: The proposal was approved as a reference to the new NFPA standard 652 is necessary. This reference will provide more information on determining dust hazards and coordination with NFPA is important. There were some concerns about how this new standard would work with the more industry standards. For instance NFPA 664 is better for wood than potentially a more general reference to NFPA 652.

Assembly Action: **None**

Public Comments

Public Comment 1:

Robert Davidson, Davidson Code Concepts, LLC, representing Self (rjd@davidsoncodeconcepts.com); Gregory Keith (grkeith@mac.com) requests Approve as Modified by this Public Comment.

Modify as follows:

2203.2 Dust hazard analysis (DHA). The requirements of NFPA 652 apply to all new and existing facilities and operations with ~~potentially~~ a combustible dust hazard. Existing facilities shall have a Dust Hazards Analysis (DHA) completed in accordance with Section 7.1.2 of NFPA 652.

The fire code official shall be authorized to order a dust hazard analysis to occur sooner if a combustible dust hazard has been identified in a facility that has not previously performed an analysis.

2204.1 Specific hazards standards. The industry- or commodity-specific codes and standards listed in Table 2204.1 shall be complied with based upon the identification and evaluation of the specific fire and deflagration hazards that ~~potentially~~ exist at a facility.

Commenter's Reason: The purpose of this public comment is to clarify application of the new requirements.

The word "potentially' has been struck from Section 2203.2 and new language added to clarify that it is a combustible dust "hazard" that is the target of the language. You could have combustible dust present without being a hazard, such as in bags in a storage facility.

The wording "be authorized to" has been added after the word "shall" in the second paragraph of Section 2203.2 to clarify that the intent is to give the fire code authority to act, not to command the fire code official to act.

The word "potentially" is struck from Section 2204.1. These referenced standards are applied after the combustible dust hazard has been confirmed.

Final Action Results

F258-16 **AMPC1**

Code Change No: F274-16

Original Proposal

Section: 2311, 2311.7, 2311.7.1 (New), 2311.7.1, 2311.7.1.1, 2311.7.1.2, 2311.7.2, 2311.7.2.1, 2311.7.2.1.1, 2311.7.2.2, 2311.7.2.3; IMC: [F]502.16, [F]502.16.1 (New), [F]502.16.2 (New), [F]502.16.1, [F]502.16.2, Chapter 15; IFGC: 703.1, 703.1.1 (IMC: [FG] 304.5.1) 703.1.1.1 (IMC: [FG] 304.5.1.1),703.1.1.2 (IMC [FG] 304.5.1.2), 703.1.2 (IMC:[FG] 304.5.2), 703.1.3 (IMC:[FG] 304.5.3), Chapter 8

Proponent: Robert Davidson, Davidson Code Concepts, LLC, representing Quong & Associates, Inc./Toyota (rjd@davidsoncodeconcepts.com) ; Martin Gresho (marty@fp2fire.com)

Revise as follows:

CHAPTER 23
MOTOR FUEL-DISPENSING FACILITIES AND REPAIR GARAGES

SECTION 2311
REPAIR GARAGES

2311.7 Repair garages for vehicles fueled by lighter-than-air fuels. Repair garages for the conversion and repair of vehicles that use CNG, liquefied natural gas (LNG), hydrogen or other lighter-than-air motor fuels shall be in accordance with Sections 2311.7 through ~~2311.7.2.3~~ 2311.7.3.3 in addition to the other requirements of Section 2311.

Exceptions:

1. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
2. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain ~~a quantity that is~~ less than 200 cubic feet (5.6 m^3) of hydrogen.

Add new text as follows:

2311.7.1 Repair garages used for the repair of hydrogen-fueled vehicles. Repair garages used for the repair of hydrogen-fueled vehicles shall be provided with an approved exhaust ventilation system in accordance with the International Mechanical Code and Chapter 6 of NFPA 2.

Revise as follows:

~~**2311.7.1**~~ **2311.7.2 Exhaust Ventilation System.** Repair garages used for the repair of CNG, liquefied natural gas~~-~~ (LNG), or ~~hydrogen-fueled vehicles~~ other lighter-than-air motor fuels other than hydrogen shall be provided with an *approved* mechanical exhaust ventilation system. The mechanical ventilation system shall be in accordance with the *International Mechanical Code* and Sections ~~2311.7.1.1~~ 2311.7.2.1 and ~~2311.7.1.2~~ 2311.7.2.2.

Exception: ~~Repair garages with natural ventilation when *approved*.~~ Where approved by the fire code official, natural ventilation shall be permitted in lieu of mechanical exhaust ventilation.

~~2311.7.1.1~~ **2311.7.2.1 Design.** Indoor locations shall be ~~ventilated~~ exhausted utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on ~~exterior~~ walls near floor level. Outlets shall be located at the high point of the room in ~~exterior~~ walls or the roof.

~~Ventilation~~ Exhaust ventilation shall be by a continuous mechanical exhaust ventilation system or by a mechanical exhaust ventilation system activated by a continuously monitoring natural gas detection system ~~or, for hydrogen, a continuously monitoring flammable gas detection system, each~~ activating at a gas concentration of not more than 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure of the ventilation system.

The exhaust ventilation rate shall be not less than 1 cubic foot per minute per 12 cubic feet [0.00139 $m^3 \times (s \cdot m^3)$] of room volume.

2311.7.2.2 Operation. ~~Activation of the gas detection~~ The mechanical exhaust ventilation system shall ~~result in all the following:~~ operate continuously.

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

Exceptions:

1. Mechanical exhaust ventilation systems that are interlocked with a gas detection system designed in accordance with Sections 2311.7.3 through 2311.7.3.3.
2. Mechanical exhaust ventilation systems in repair garages that are used only for repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the exhaust ventilation system is electrically interlocked with the lighting circuit.

~~2311.7.2~~ **2311.7.3 Gas detection system.** *No change to text.*

~~2311.7.2.1~~ **2311.7.3.1 System design.** *No change to text.*

~~2311.7.2.1.1~~ **2311.7.3.1.1 Gas detection system components.** *No change to text.*

~~2311.7.2.2~~ **2311.7.3.2 Operation.** Activation of the gas detection system shall result in all the following:

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

~~2311.7.2.3~~ **2311.7.3.3 Failure of the gas detection system.** Failure of the gas detection system shall result in the deactivation of the heating system, activation of the mechanical exhaust ventilation system where the system is interlocked with the gas detection system and cause a trouble signal to sound in an *approved* location.

2015 International Mechanical Code

Revise as follows:

[F] 502.16 Repair garages for ~~natural gas and hydrogen fueled~~ vehicles fueled by lighter-than-air fuels. Repair garages used for the conversion and repair of vehicles which use CNG, liquefied natural

gas (LNG), hydrogen or ~~hydrogen-fueled vehicles~~ other lighter-than-air motor fuels shall be provided with an *approved* mechanical exhaust ventilation system. The mechanical exhaust ventilation system shall be in accordance with Sections 502.16.1 ~~and~~ or 502.16.2 as applicable.

~~Exception~~ Exceptions: ~~Where *approved* by the code official, *natural ventilation* shall be permitted in lieu of mechanical ventilation.~~

1. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
2. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain a quantity that is less than 200 cubic feet (5.6 m3) of hydrogen.

Add new text as follows:

[F] 502.16.1 Repair garages used for the repair of hydrogen-fueled vehicles Repair garages used for the repair of hydrogen-fueled vehicles shall be provided with an approved exhaust ventilation system in accordance with this code and Chapter 6 of NFPA 2.

[F] 502.16.2 Exhaust ventilation system Repair garages used for the repair of CNG, liquefied natural gas (LNG), or other lighter-than-air motor fuels other than hydrogen shall be provided with an approved mechanical exhaust ventilation system. The mechanical exhaust ventilation system shall be in accordance with this code and Sections 502.16.2.1 and 502.16.2.2.

Exception: Where approved by the code official, natural ventilation shall be permitted in lieu of mechanical exhaust ventilation.

Revise as follows:

[F] ~~502.16.1~~502.16.2.1 Design. Indoor locations shall be ~~ventilated~~ exhausted utilizing air supply inlets and exhaust outlets arranged to provide uniform air movement to the extent practical. Inlets shall be uniformly arranged on ~~exterior~~ walls near floor level. Outlets shall be located at the high point of the room in ~~exterior~~ walls or the roof.

~~Ventilation~~ Exhaust ventilation shall be by a continuous mechanical exhaust ventilation system or by a mechanical exhaust ventilation system activated by a continuously monitoring natural gas detection system, ~~or for hydrogen, a continuously monitoring flammable gas detection system, each~~ activating at a gas concentration of 25 percent of the lower flammable limit (LFL). In all cases, the system shall shut down the fueling system in the event of failure of the exhaust ventilation system.

The exhaust ventilation rate shall be not less than 1 cubic foot per minute per 12 cubic feet [0.00138 $m^3/(s \cdot m^3)$] of room volume.

[F] ~~502.16.2~~ 502.16.2.2 Operation. The mechanical exhaust ventilation system shall operate continuously.

Exceptions:

1. Mechanical exhaust ventilation systems that are interlocked with a gas detection system designed in accordance with the *International Fire Code*.
2. Mechanical exhaust ventilation systems in garages that are used only for the repair of vehicles fueled by liquid fuels or odorized gases, such as CNG, where the exhaust ventilation system is electrically interlocked with the lighting circuit.

2015 International Fuel Gas Code

703.1 Hydrogen-generating and refueling operations. Hydrogen-generating and refueling appliances shall be installed and located in accordance with their listing and the manufacturer's instructions. ~~Ventilation~~ Exhaust ventilation shall be required in ~~accordance with Section 703.1.1, 703.1.2 or 703.1.3 in~~ public garages, private garages, repair garages, automotive motor fuel-dispensing facilities and parking garages that contain hydrogen-generating appliances or refueling systems in accordance with NFPA 2. For the purpose of this section, rooms or spaces that are not part of the living space of a dwelling unit and that communicate directly with a private garage through openings shall be considered to be part of the private garage.

Delete without substitution:

~~**703.1.1 Natural ventilation.** Indoor locations intended for hydrogen-generating or refueling operations shall be limited to a maximum floor area of 850 square feet (79 m^2) and shall communicate with the outdoors in accordance with Sections 703.1.1.1 and 703.1.1.2. The maximum rated output capacity of hydrogen generating appliances shall not exceed 4 standard cubic feet per minute (0.00189 m^3/s) of hydrogen for each 250 square feet (23.2 m^2) of floor area in such spaces. The minimum cross-sectional dimension of air openings shall be 3 inches (76 mm). Where ducts are used, they shall be of the same cross-sectional area as the free area of the openings to which they connect. In such locations, equipment and appliances having an ignition source shall be located such that the source of ignition is not within 12 inches (305 mm) of the ceiling.~~

~~**703.1.1.1 Two openings.** Two permanent openings shall be provided within the garage. The upper opening shall be located entirely within 12 inches (305 mm) of the ceiling of the garage. The lower opening shall be located entirely within 12 inches (305 mm) of the floor of the garage. Both openings shall be provided in the same exterior wall. The openings shall communicate directly with the outdoors and shall have a minimum free area of $^1/_2$ square foot per 1,000 cubic feet (1 m^2/ 610 m^3) of garage volume.~~

~~**703.1.1.2 Louvers and grilles.** In calculating the free area required by Section 703.1.1.1, the required size of openings shall be based on the net free area of each opening. If the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. If the design and free area are not known, it shall be assumed that wood louvers will have 25-percent free area and metal louvers and grilles will have 75-percent free area. Louvers and grilles shall be fixed in the open position.~~

~~**703.1.2 Mechanical ventilation.** Indoor locations intended for hydrogen-generating or refueling operations shall be ventilated in accordance with Section 502.16 of the *International Mechanical Code*. In such locations, *equipment* and appliances having an *ignition source* shall be located such that the source of ignition is below the mechanical ventilation *outlet*(s).~~

~~**703.1.3 Specially engineered installations.** As an alternative to the provisions of Sections 703.1.1 and 703.1.2, the necessary supply of air for ventilation and dilution of flammable gases shall be provided by an *approved* engineered system.~~

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

IMC and IFGC
NFPA 2-2016 *Hydrogen Technologies Code*

Reason: This proposal is a comprehensive fix of the exhaust ventilation requirements for repair garages for hydrogen fueled vehicles and for exhaust ventilation requirements for the installation hydrogen-generating and refueling operations. The primary goal was consistency and correlation between the requirements found within the IFC, the IMC and the IFGC along with tighter correlation with the requirements of NFPA 2. (A special note: Currently the hydrogen exhaust requirements are blended with the requirements for other lighter than air fuels; this proposal separates those technical requirements with no technical change other than for hydrogen.)

Section 2311.7 of the fire code has been modified to separate the requirements for hydrogen fueled vehicles from other lighter than air fueled vehicles. A new Section 2311.7.1 has been added to direct the code user to NFPA 2 for hydrogen fueled vehicle repair garages.

All of the requirements for exhaust of repair garages for hydrogen fuel vehicles is covered in NFPA 2 where the IFC already directs the user for the overwhelming majority of the hydrogen as a fuel construction and operation requirements regulated by the fire code. In addition, the air exhaust rate is different in NFPA 2 for hydrogen and this proposal would point the user to the correct exhaust rate.

The exception language in 2311.7.2 (new numbering) was modified to match existing verbiage found in the IMC.

The word exhaust was added to or replaced references to ventilation throughout 2311.7 to correlate with the type of system being required in accordance with Chapter 5 Exhaust in the IMC.

The IMC correlating language found in Section 502.16 has been modified to match the scoping language found within the IFC as to types of fuels covered. The technical language has been aligned to pick up earlier changes to the IFC over several cycles as well as the new modifications proposed to separate out hydrogen fueled vehicles and point to NFPA 2 for those facilities.

Section 304.5 of the IMC, the correlating Section 703.1 of the IFGC address exhaust ventilation for occupancies with Hydrogen-generating and refueling appliances. The language has been modified to delete the three subsections and point the user to NFPA 2 where the requirements are covered. Eliminating the language provides clarification and eliminates a conflict within the mechanical code, Option 1 was natural ventilation with very specific requirements; Option 2 was mechanical exhaust which points to Section 502.16 of the mechanical code which again provided for a natural ventilation exception with no specific requirements. Option 3 was for a specialty engineered system with no parameters, as a result a designer would default to NFPA 2 for guidance.

By deleting the three options and pointing the user to NFPA 2 the correct requirements are provided including a natural ventilation option along with the other comprehensive portions of NFPA 2 that apply to this specialized type of installation.

The provisions NFPA 2 - related to the issues addressed in this proposal are found in Section 6.17 of NFPA 2-2016. A link to the NFPA website where free access is provided to the standard is as follows: NFPA 2

Cost Impact: Will not increase the cost of construction

This proposal will reduce the cost of installation by eliminating an internal conflict within the IMC, by correlating all of the ICC codes dealing with this topic, and by providing for tighter correlation with NFPA 2 which the I-Codes already refer to for these types of installations.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved based upon the proponent's reason statement.

Assembly Action: **None**

Final Action Results

F274-16 **AS**

Code Change No: F283-16

Original Proposal

Section: 202, 2404.2, 2404.3.1, 2404.3.1.1, 914.9; IBC: 416, [F] 416.1, 416.2.1 (New), [F] 416.2.1, [F] 416.2.2, [F] 416.3.1, [F] 416.5

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

Revise as follows:

SPRAY ROOM. A room designed to accommodate spraying operations, constructed in accordance with the *International Building Code* ~~and separated from the remainder of the building by a minimum 1-hour *fire barrier*~~.

2404.2 Location of spray-finishing operations. Spray-finishing operations conducted in buildings used for Group A, E, I or R occupancies shall be located in a spray room protected with an *approved automatic sprinkler system* installed in accordance with Section 903.3.1.1 and separated vertically and horizontally from ~~other areas~~ the remainder of the building by fire barrier walls and horizontal assemblies with not less than a 1-hour fire-resistance rating in accordance with the *International Building Code*. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or limited spraying space *approved* for such use.

Exceptions:

1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with *approved* natural or mechanical ventilation shall be exempt from the provisions of Section 2404 when *approved* and where utilizing Class IIIA or IIIB *combustible liquids*.
2. In buildings other than Group A, E, I or R occupancies, *approved* limited spraying space in accordance with Section 2404.9.
3. Resin application areas used for manufacturing of reinforced plastics complying with Section 2409 shall not be required to be located in a spray room, spray booth or spraying space.

2404.3.1 Spray rooms. Spray rooms shall be constructed and designed in accordance with Section ~~2404.3.1.1 and~~ 416 of the *International Building Code* and Section 2404.3.2, and shall comply with Sections 2404.4 through 2404.8.

~~**2404.3.1.1**~~ **2404.3.2 Floor.** *No change to text.*

914.9 Application of flammable finishes. An *automatic sprinkler system* or fire-extinguishing system shall be provided in all spray~~, dip~~ rooms and ~~immersing spaces and storage rooms~~ spray booths, and shall be installed in accordance with Chapter 9.

2015 International Building Code

Revise as follows:

SECTION 416
SPRAY APPLICATION OF FLAMMABLE FINISHES

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

Add new text as follows:

416.2.1 Construction. Walls and ceilings of spray rooms shall be constructed of noncombustible materials or the interior surface shall be completely covered with noncombustible materials. Aluminum shall not be used.

Revise as follows:

[F] 416.2.1 Surfaces. The interior surfaces of spray rooms shall be smooth and shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning, and shall be so designed to confine residues within the room. ~~Aluminum shall not be used.~~

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

[F] 416.3.1 Surfaces. The interior surfaces of spraying spaces shall be smooth and ~~continuous without edges;~~ shall be so constructed to permit the free passage of exhaust air from all parts of the interior and to facilitate washing and cleaning; and shall be so designed to confine residues within the spraying space. Aluminum shall not be used.

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

Reason: This proposed code change is intended to correlate the requirements for spray operations in the IBC and the IFC.
First, the definition of spray room is revised. The definition of a term is never a good location for code requirements. This proposal removes the 1-hour separation construction requirement from the definition of spray room and places the requirement into Section 2404.2 where it belongs. This revision also correlates with IBC Section 416.2 which requires the 1-hour separation.

In IFC Section 2404.2, the separation requirement is clarified that the separation is between the spray room and other portions of the building. The requirement has been misapplied by requiring the exterior wall of the building, which is also the spray room wall, to be fire resistant construction. In this design, only the interior walls would be fire resistance rated, in order to separate the spray room from the remainder of the building.

Also, the term "limited" is added to correlate with the limited spray area requirements. A "spraying space" is the result of spraying operation and the limit of hazardous vapors; it is not an area to designate as a spraying location. A "limited spraying space", by definition, is an area where spraying can occur outside of a spray room or spray booth.

After the term dip tank is removed from IBC Section 416.5, the remaining provisions in IBC Section 416 all apply to spray operations. Therefore, the title of IBC Section 416 is revised to refer to the spray application of flammable finishes. This includes spray rooms, spray booths and spraying spaces.

The IFC contains requirements for ventilation and interlocking the ventilation system with the spraying apparatus.

IFC Section 2404.3.1 is revised so it correlates with IBC Section 416.2 with regard to construction of spray rooms.

IFC Section 914.9 and IBC Section 416.5 are revised to be consistent with IFC Section 2405.4. A fire extinguishing system is not required for all dipping operations. For dip tanks less than 150 gallons, a fire extinguishing system is an optional method or protection.

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

Cost Impact: Will not increase the cost of construction
This proposal correlates the spray finishing requirements in the IFC and the IBC.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

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

Assembly Action: **None**

Final Action Results

F283-16 **AS**

Code Change No: F293-16

Original Proposal

Section: IBC: [F] 415.11.1.1.1; IFC: 2704.2.2.1

Proponent: Patrick McLaughlin, representing Semiconductor Industry Association

Revise as follows:

TABLE 2704.2.2.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]
(Portions of table not shown remain unchanged)

For SI:1 pound per square foot = 4.882 kg/m ^{2} , 1 gallon per square foot = 40.7 L/m ^{2} , 1 cubic foot @ NTP/square foot = 0.305 m ^{3} @ NTP/m ^{2} , 1 cubic foot = 0.02832 m ^{3} .
a. Hazardous materials within piping shall not be included in the calculated quantities.
b. Quantity of hazardous materials in a single fabrication area shall not exceed the maximum allowable quantities per control area in Tables 5003.1.1(1) and 5003.1.1(2).
c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 cubic feet or a density of 0.2 ft ^{3} per ft ^{2} at NTP.
e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 5003.8.2.

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TABLE [F] 415.11.1.1.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

(Portions of table not shown remain unchanged)

For SI: 1 pound per square foot = 4.882 kg/m ^{2} , 1 gallon per square foot = 40.7 L/m ^{2} , 1 cubic foot @ NTP/square foot = 0.305 m ^{3} @ NTP/m ^{2} , 1 cubic foot = 0.02832 m ^{3} .
a. Hazardous materials within piping shall not be included in the calculated quantities.
b. Quantity of hazardous materials in a single fabrication shall not exceed the maximum allowable quantities per control area in Tables 307.1(1) and 307.1(2).
c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed 9,000 cubic feet or a density of 0.2 ft ^{3} per ft ^{2} at NTP.
e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.6.2.

Reason: The Semiconductor Industry Association is proposing a change in the allowable aggregate quantity of specified gases from a cubic feet limit of 9000 cubic feet to also allow a density limit of 0.2ft^3 per ft^2. This density is equivalent to a 45,000 ft^{2}fabrication area with the current 9000 ft^3 limit. Significant increases in building size has occurred with the introduction of the 300 millimeter wafer. Larger fabrication areas safely accommodate these limits due to the restriction being normalized versus an absolute limit. When the 9000 ft^3 limit was added to the Uniform Fire Code in 1988, wafer sizes, buildings and fabrication areas tended to be much smaller. For example, the 1991 Gartner fabrication area database lists 34 manufacturing fabrication areas with an average size of 26,000 ft^2. Applying the 9000 ft^3 aggregate gas limit to this size fabrication area would allow a density of 0.35 cu/ft^2 which has been demonstrated to be a safe limit for the industry. It is almost a two times greater density than what is being proposed in this code change. Density limits are the norm in these tables for liquids, solids and oxidizing gases, and provide a precedent for what is being proposed.

The industry places these manufacturing gases in the fabrication area because low vapor pressure gases need to be close to the tool due to the inability to deliver these gases with excessive line lengths.

In summary, fabrication areas have an excellent history of safely managed toxic and flammable gases with safety controls such as exhausted gas cabinets, continuously welded gas piping, and gas detection with auto-shutdown. The 9000 ft^3 limit was established during the development of the old Uniform Building and Fire Codes Group H-6 classification in the 1980s because it represented the quantity used at the time. The industry used smaller cylinders, but more of them than today. The trend has been toward fewer but larger cylinders, but with more controls such as reduced flow orifices (RFOs), sub-atmospheric gas delivery, better gas and flame detection, as well as other safety features. Also, the fire protection features are much better today and in many cases better codified. The 9,000 ft^3 limit is an outdated threshold, based on older technology and design.

Cost Impact: Will not increase the cost of construction
It may reduce the cost because the manufacturing gases can continue to be placed near the tools where they are used instead of causing them to be piped in from remote locations.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

TABLE 2704.2.2.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

For SI:1 pound per square foot = 4.882 kg/m^2 , 1 gallon per square foot = 40.7 L/m^2 , 1 cubic foot @ NTP/square foot = 0.305 m^3 @ NTP/m^2 , 1 cubic foot = 0.02832 m^3 .
a. Hazardous materials within piping shall not be included in the calculated quantities.
b. Quantity of hazardous materials in a single fabrication area shall not exceed the maximum allowable quantities per control area in Tables 5003.1.1(1) and 5003.1.1(2).
c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed the greater of 0.2 cubic feet at NTP/square foot or 9,000 cubic feet ~~or a density of 0.2 ft 3 per ft 2~~ at NTP.
e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 5003.8.2.

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TABLE [F] 415.11.1.1.1
QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5[a]

For SI: 1 pound per square foot = 4.882 kg/m^2 , 1 gallon per square foot = 40.7 L/m^2 , 1 cubic foot @ NTP/square foot = 0.305 m^3 @ NTP/m^2 , 1 cubic foot = 0.02832 m^3 .
a. Hazardous materials within piping shall not be included in the calculated quantities.

b. Quantity of hazardous materials in a single fabrication shall not exceed the maximum allowable quantities per control area in Tables 307.1(1) and 307.1(2).
c. Densely packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
d. The aggregate quantity of flammable, pyrophoric, toxic and highly toxic gases shall not exceed the greater of 0.2 cubic feet at NTP/ square foot or 9,000 cubic feet ~~or a density of 0.2 ft ^{3} per ft ^{2}~~ at NTP.
e. The aggregate quantity of pyrophoric gases in the building shall not exceed the amounts set forth in Table 415.6.2.

Committee Reason: The proposal was approved based upon the proponents reason statement. The modification addresses the fact that the original intent of the proposal was to address the greater of the two amounts.

Assembly Action **None**

Final Action Results

F293-16 **AM**

Code Change No: F298-16

Original Proposal

Section: IFC: 105.6.45, [A] 105.7.18, 202, 202 (New), TABLE 906.1 (IBC TABLE 906.1), 3101, 3101.1, 3103, 3104; IBC: 202, 202 (New), 3103.1

Proponent: Lori Jessell, Novato Fire Protection District, representing California Fire Chiefs Association; Adria Reinertson, Riverside County Fire Department, representing California Fire Chiefs Association (adriar@moval.org)

2015 International Fire Code

Revise as follows:

MEMBRANE STRUCTURE. An air-inflated, air-supported, cable or frame-covered structure as defined by the *International Building Code* and not otherwise defined as a tent or umbrella structure. See Chapter 31 of the *International Building Code*.

[BG] TENT. A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects. (see "Umbrella structure" and "Membrane structure")

Add new definition as follows:

UMBRELLA STRUCTURE. A structure, enclosure or shelter with or without sidewalls or drops, constructed of fabric or pliable material supported by a central pole. (see "Mebrane structure" and "Tent")

Revise as follows:

CHAPTER 31
TENTS, UMBRELLA STRUCTURES AND OTHER MEMBRANE STRUCTURES

SECTION 3101
GENERAL

3101.1 Scope. Tents, umbrella structures, temporary stage canopies and membrane structures shall comply with this chapter. The provisions of Section 3103 are applicable only to temporary tents, umbrella structures, and membrane structures. The provisions of Section 3104 are applicable to temporary and permanent tents, umbrella structures, and membrane structures. Other temporary structures shall comply with the *International Building Code*.

SECTION 3103
TEMPORARY TENTS, UMBRELLA STRUCTURES AND MEMBRANE STRUCTURES

3103.1 General. Tents, umbrella structures and membrane structures used for temporary periods shall comply with this section. Other temporary structures erected for a period of 180 days or less shall comply with the *International Building Code*.

3103.2 Approval required. Tents, umbrella structures and membrane structures having an area in excess of 400 square feet (37 m^2) shall not be erected, operated or maintained for any purpose without first obtaining a permit and approval from the *fire code official*.

Exceptions:

1. Tents or umbrella structures used exclusively for recreational camping purposes.
2. Tents or umbrella structures open on all sides that comply with all of the following:
   2.1. Individual tents or umbrella structures having a maximum size of 700 square feet (65 m^2).
   2.2. The aggregate area of multiple tents or umbrella structures placed side by side without a fire break clearance of 12 feet (3658 mm), not exceeding 700 square feet (65 m^2) total.
   2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents or umbrella structures.

3103.3 Place of assembly. For the purposes of this chapter, a place of assembly shall include a circus, carnival, tent show, theater, skating rink, dance hall or other place of assembly in or under which persons gather for any purpose.

3103.4 Permits. Permits shall be required as set forth in Sections 105.6 and 105.7.

3103.5 Use period. Temporary tents, umbrella structures, air-supported, air-inflated or tensioned membrane structures shall not be erected for a period of more than 180 days within a 12-month period on a single premises.

3103.6 Construction documents. A detailed site and floor plan for tents, umbrella structures or membrane structures with an *occupant load* of 50 or more shall be provided with each application for approval. The tent, umbrella structure or membrane structure floor plan shall indicate details of the *means of egress* facilities, seating capacity, arrangement of the seating and location and type of heating and electrical equipment.

3103.7 Inspections. The entire tent, umbrella structures, air-supported, air-inflated or tensioned membrane structure system shall be inspected at regular intervals, but not less than two times per permit use period, by the permittee, *owner* or agent to determine that the installation is maintained in accordance with this chapter.

Exception: Permit use periods of less than 30 days.

3103.7.1 Inspection report. Where required by the *fire code official*, an inspection report shall be provided and shall consist of maintenance, anchors and fabric inspections.

3103.8 Access, location and parking. Access, location and parking for temporary tents, umbrella structures and membrane structures shall be in accordance with this section.

3103.8.1 Access. Fire apparatus access roads shall be provided in accordance with Section 503.

3103.8.2 Location. Tents, umbrella structures or membrane structures shall not be located within 20 feet (6096 mm) of *lot lines*, buildings, other tents, umbrella structures or membrane structures, parked vehicles or internal combustion engines. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure, umbrella structures or tent.

Exceptions:

1. Separation distance between membrane structures, umbrella structures and tents not used for cooking is not required where the aggregate floor area does not exceed 15,000 square feet (1394 m^2).
2. Membrane structures, umbrella structures or tents need not be separated from buildings when all of the following conditions are met:
   2.1. The aggregate floor area of the membrane structure, umbrella structures or tent shall not exceed 10,000 square feet (929 m^2).

2.2. The aggregate floor area of the building and membrane structure, umbrella structures or tent shall not exceed the allowable floor area including increases as indicated in the *International Building Code*.
2.3. Required *means of egress* are provided for both the building and the membrane structure, umbrella structures or tent including travel distances.
2.4. Fire apparatus access roads are provided in accordance with Section 503.

3103.8.3 Location of structures in excess of 15,000 square feet in area. Membrane structures having an area of 15,000 square feet (1394 m^2) or more shall be located not less than 50 feet (15 240 mm) from any other tent, umbrella structures or structure as measured from the sidewall of the tent, umbrella structures or membrane structure unless joined together by a corridor.

3103.8.4 Membrane structures on buildings. Membrane structures that are erected on buildings, balconies, decks or other structures shall be regulated as permanent membrane structures in accordance with Section 3102 of the *International Building Code*.

3103.8.5 Connecting corridors. Tents, umbrella structures or membrane structures are allowed to be joined together by means of corridors. *Exit* doors shall be provided at each end of such corridor. On each side of such corridor and approximately opposite each other, there shall be provided openings not less than 12 feet (3658 mm) wide.

3103.8.6 Fire break. An unobstructed fire break passageway or fire road not less than 12 feet (3658 mm) wide and free from guy ropes or other obstructions shall be maintained on all sides of all tents, umbrella structures and membrane structures unless otherwise *approved* by the *fire code official*.

3103.9 Anchorage required. Tents, umbrella structures or membrane structures and their appurtenances shall be adequately roped, braced and anchored to withstand the elements of weather and prevent against collapsing. Documentation of structural stability shall be furnished to the *fire code official* on request.

3103.9.1 Tents and membrane structures exceeding one story. Tents and membrane structures exceeding one story shall be designed and constructed to comply with Chapter 16 of the *International Building Code*.

3103.11 Seating arrangements. Seating in tents, umbrella structures or membrane structures shall be in accordance with Chapter 10.

3103.12 Means of egress. *Means of egress* for temporary tents, umbrella structures and membrane structures shall be in accordance with Sections 3103.12.1 through 3103.12.8.

3103.12.1 Distribution. *Exits* shall be spaced at approximately equal intervals around the perimeter of the tent, umbrella structures or membrane structure, and shall be located such that all points are 100 feet (30 480 mm) or less from an *exit*.

3103.12.2 Number. Tents, umbrella structures or membrane structures or a usable portion thereof shall have not less than one *exit* and not less than the number of *exits* required by Table 3103.12.2. The total width of *means of egress* in inches (mm) shall be not less than the total *occupant load* served by a *means of egress* multiplied by 0.2 inches (5 mm) per person.

TABLE 3103.12.2
MINIMUM NUMBER OF MEANS OF EGRESS AND MEANS OF EGRESS WIDTHS FROM TEMPORARY MEMBRANE STRUCTURES, UMBRELLA STRUCTURES AND TENTS

OCCUPANT LOAD	MINIMUM NUMBER OF MEANS OF EGRESS	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)	MINIMUM WIDTH OF EACH MEANS OF EGRESS (inches)
		Tent or Umbrella Structure	Membrane Structure
10 to 199	2	72	36
200 to 499	3	72	72
500 to 999	4	96	72
1,000 to 1,999	5	120	96
2,000 to 2,999	6	120	96
Over 3,000[a]	7	120	96

For SI: 1 inch = 25.4 mm.

a. When the occupant load exceeds 3,000, the total width of means of egress (in inches) shall be not less than the total occupant load multiplied by 0.2 inches per person.

3103.12.3 Exit openings from tents or umbrella structures. *Exit* openings from tents or umbrella structures shall remain open unless covered by a flame-resistant curtain. The curtain shall comply with the following requirements:

1. Curtains shall be free sliding on a metal support. The support shall be not less than 80 inches (2032 mm) above the floor level at the *exit*. The curtains shall be so arranged that, when open, no part of the curtain obstructs the *exit*.
2. Curtains shall be of a color, or colors, that contrasts with the color of the tent or umbrella structures.

SECTION 3104
TEMPORARY AND PERMANENT TENTS, UMBRELLA STRUCTURES AND MEMBRANE STRUCTURES

3104.1 General. Tents, umbrella structures and membrane structures, both temporary and permanent, shall be in accordance with this section. Permanent tents, umbrella structures and membrane structures shall also comply with the *International Building 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 executed by an *approved* testing laboratory certifying that the tents, umbrella structures and membrane structures and their appurtenances; sidewalls, drops and tarpaulins; floor coverings, bunting and combustible decorative materials and effects, including sawdust where used on floors or passageways, are composed of material meeting the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 or shall be treated with a flame retardant in an *approved* manner and meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701, and that such flame propagation performance criteria are effective for the period specified by the permit.

3104.3 Label. Membrane structures, umbrella structures or tents shall have a permanently affixed label bearing the identification of size and fabric or material type.

3104.4 Certification. An affidavit or affirmation shall be submitted to the *fire code official* and a copy retained on the premises on which the tent, umbrella structure or air-supported structure is located. The affidavit shall attest to all of the following information relative to the flame propagation performance criteria of the fabric:

1. Names and address of the *owners* of the tent, umbrella structure or air-supported structure.
2. Date the fabric was last treated with flame-retardant solution.
3. Trade name or kind of chemical used in treatment.
4. Name of person or firm treating the material.
5. Name of testing agency and test standard by which the fabric was tested.

3104.5 Combustible materials. Hay, straw, shavings or similar combustible materials shall not be located within any tent, umbrella structure or membrane structure containing an assembly occupancy, except the materials necessary for the daily feeding and care of animals. Sawdust and shavings utilized for a public performance or exhibit shall not be prohibited provided the sawdust and shavings are kept damp. Combustible materials shall not be permitted under stands or seats at any time.

3104.6 Smoking. Smoking shall not be permitted in tents, umbrella structures or membrane structures. *Approved* "No Smoking" signs shall be conspicuously posted in accordance with Section 310.

3104.7 Open or exposed flame. Open flame or other devices emitting flame, fire or heat or any flammable or *combustible liquids*, gas, charcoal or other cooking device or any other unapproved devices shall not be permitted inside or located within 20 feet (6096 mm) of the tent, umbrella structure or membrane structures while open to the public unless *approved* by the *fire code official.*

3104.8 Fireworks. Fireworks shall not be used within 100 feet (30 480 mm) of tents, umbrella structures or membrane structures.

3104.10 Safety film. Motion pictures shall not be displayed in tents, umbrella structures or membrane structures unless the motion picture film is safety film.

3104.15.2 Venting. Gas, liquid and solid fuel-burning equipment designed to be vented shall be vented to the outside air as specified in the *International Fuel Gas Code* and the *International Mechanical Code*. Such vents shall be equipped with *approved* spark arresters where required. Where vents or flues are used, all portions of the tent, umbrella structure or membrane structure shall be not less than 12 inches (305 mm) from the flue or vent.

3104.15.5 Cooking tents or umbrella structures. Tents or umbrella structures with sidewalls or drops where cooking is performed shall be separated from other tents, umbrella structures or membrane structures by not less than 20 feet (6096 mm).

3104.15.6 Outdoor cooking. Outdoor cooking that produces sparks or grease-laden vapors shall not be performed within 20 feet (6096 mm) of a tent, umbrella structure or membrane structure.

3104.16.2 Location of containers. LP-gas containers shall be located outside. Safety release valves shall be pointed away from the tent, umbrella structure or membrane structure.

3104.16.3 Protection and security. Portable LP-gas containers, piping, valves and fittings that are located outside and are being used to fuel equipment inside a tent, umbrella structure or membrane structure shall be adequately protected to prevent tampering, damage by vehicles or other hazards and shall be located in an *approved* location. Portable LP-gas containers shall be securely fastened in place to prevent unauthorized movement.

3104.17.1 Use. Flammable-liquid-fueled equipment shall not be used in tents, umbrella structures or membrane structures.

3104.17.2 Flammable and combustible liquid storage. Flammable and *combustible liquids* shall be stored outside in an *approved* manner not less than 50 feet (15 240 mm) from tents, umbrella structure or membrane structures. Storage shall be in accordance with Chapter 57.

3104.17.3 Refueling. Refueling shall be performed in an *approved* location not less than 20 feet (6096 mm) from tents, umbrella structures or membrane structures.

3104.18.2 Fuel. Vehicles or equipment shall not be fueled or defueled within the tent, umbrella structure or membrane structure.

3104.18.5 Competitions and demonstrations. Liquid and gas-fueled vehicles and equipment used for competition or demonstration within a tent, umbrella structure or membrane structure shall comply with Sections 3104.18.5.1 through 3104.18.5.3.

3104.19 Separation of generators. Generators and other internal combustion power sources shall be separated from tents, umbrella structures 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.

3104.20 Standby personnel. Where, in the opinion of the *fire code official*, it is essential for public safety in a tent, umbrella structure or membrane structure used as a place of assembly or any other use where people congregate, because of the number of persons, or the nature of the performance, exhibition, display, contest or activity, the *owner*, agent or lessee shall employ one or more qualified persons, as required and *approved*, to remain on duty during the times such places are open to the public, or when such activity is being conducted.

3104.21 Combustible vegetation. Combustible vegetation that could create a fire hazard shall be removed from the area occupied by a tent, umbrella structure or membrane structure, and from areas within 30 feet (9144 mm) of such structures.

3104.22 Combustible waste material. The floor surface inside tents, umbrella structures or membrane structures and the grounds outside and within a 30-foot (9144 mm) perimeter shall be kept free of combustible waste and other combustible materials that could create a fire hazard. Such waste shall be stored in *approved* containers and removed from the premises not less than once a day during the period the structure is occupied by the public.

105.6.45 Temporary membrane structures, umbrella structures and tents. An operational permit is required to operate an air-supported temporary membrane structure, a temporary stage canopy, an umbrella structure or a tent having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents or umbrella structure used exclusively for recreational camping purposes.
2. Tents or umbrella structure open on all sides, which comply with all of the following:
   2.1. Individual tents or umbrella structures having a maximum size of 700 square feet (65 m^2).
   2.2. The aggregate area of multiple tents or umbrella structures placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
   2.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents or umbrella structures shall be provided.

[A] 105.7.18 Temporary membrane structures and tents. A construction permit is required to erect an air-supported temporary membrane structure, a temporary stage canopy ~~or~~, a tent or an umbrella structure having an area in excess of 400 square feet (37 m^2).

Exceptions:

1. Tents or umbrella structures used exclusively for recreational camping purposes.
2. Funeral tents and curtains, or extensions attached thereto, when used for funeral services.
3. Tents and umbrella structures and awnings open on all sides, which comply with all of the following:

3.1. Individual tents and umbrella structures shall have a maximum size of 700 square feet (65 m^2).
3.2. The aggregate area of multiple tents or umbrella structures placed side by side without a fire break clearance of not less than 12 feet (3658 mm) shall not exceed 700 square feet (65 m^2) total.
3.3. A minimum clearance of 12 feet (3658 mm) to structures and other tents or umbrella structures shall be maintained.

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
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, umbrella structures 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

SECTION	SUBJECT
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

2015 International Building Code

Revise as follows:

TENT. A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects. (see "Umbrella structure")

Add new text as follows:

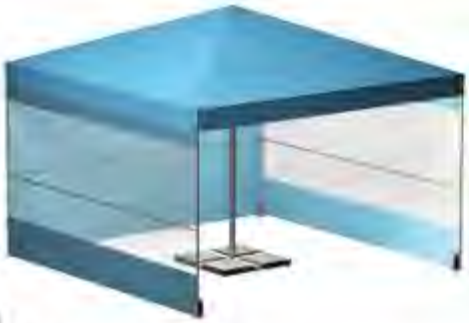
UMBRELLA STRUCTURE. A structure with or without sidewalls or drops, constructed of fabric or pliable material supported by a central pole. (see "Tent")

SECTION 3103
TEMPORARY STRUCTURES

Revise as follows:

3103.1 General. The provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days. Tents, umbrella structures and other membrane structures erected for a period of less than 180 days shall comply with the *International Fire Code*. Those erected for a longer period of time shall comply with applicable sections of this code.

Reason: Umbrellas are available that meet or exceed the 400 square foot individual size and have optional accessories that allow multiple umbrellas to be connected to each other for additional size and stability which can offer extended weather protection. These accessories include rain gutter systems, side panels (with or without support poles), and additional electrical wiring for lights and heater attachments. These accessories allow the user to mimic a tent with or without sides and of substantial size to be used as protection over an assembly occupancy. The fabric, however, due to being an "umbrella" may not meet flame retardant standards, yet can be connected together and used as a temporary or permanent cover over an assembly occupancy, outdoor events, rooftop covers and more directly adjacent to buildings. Umbrellas are not typically regulated due to their singular size, but once connected and enlarged, they continue to remain outside of enforcement due to not being included in the definition of a tent. Including the term "umbrella structure" in and as part of definitions, would allow Code Officials clear language to enforce tent regulations when umbrellas reach an individual or collective size to form a structure equivalent to a tent. See photo examples attached.

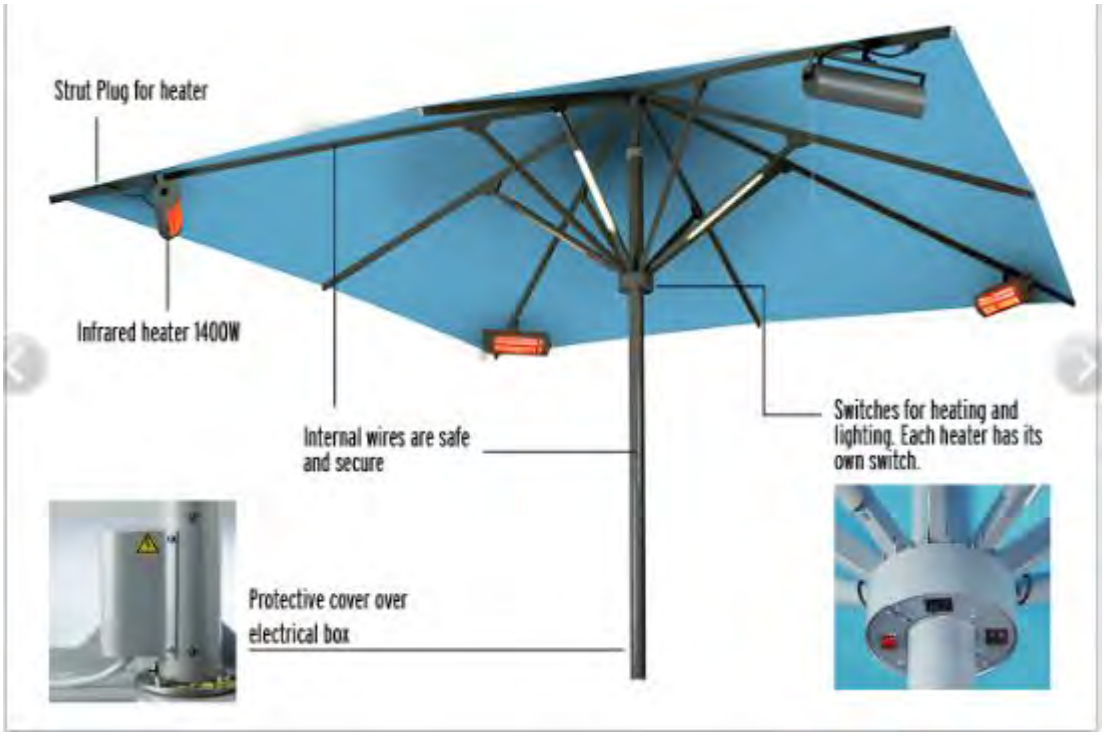


Side Panels

Enclose your shades and protect your guests from wind, sun and rain. Not just for classic pavilion models, side panels are customizable to fit any square or rectangular shade. Side panels easily affix to the strut end with grommets and are secured along the edge of the canopy with Velcro tabs. Corners can be zippered together for a complete enclosure effect. Available in solid panel or clear acrylic window options.

Support poles

For added strength, support poles can add stability to side panel installations. Aluminum telescopic poles vertically affix to the struts and are weighted at the bottom to provide additional support to side panels. If additional stability is needed, cross brackets can also be included to connect corner poles. For custom support poles, technical drawing can be provided.



Stainless steel ground anchor with electricity

Short model BBKE

Length: 25 cm / 9".
Size of base: min. 50 x 50 x 50 cm
min. 19 x 19 x 19"

Standard solution for basic concrete footings.

Cost Impact: Will not increase the cost of construction
Adding clarification and new definition to ensure these installations are captured by current code.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

2015 International Fire Code

MEMBRANE STRUCTURE. An air-inflated, air-supported, cable or frame-covered structure as defined by the *International Building Code* and not otherwise defined as a tent or umbrella structure. See Chapter 31 of the *International Building Code*.

[BG] TENT. A structure, enclosure, umbrella structure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects. (see "Umbrella structure" and "Membrane structure")

UMBRELLA STRUCTURE. A structure, enclosure or shelter with or without sidewalls or drops, constructed of fabric or pliable material supported by a central ~~pole~~pole(s). (see "Membrane structure" and "Tent")

2015 International Building Code

TENT. A structure, enclosure, umbrella structure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects. (see "Umbrella structure")

UMBRELLA STRUCTURE. A structure with or without sidewalls or drops, constructed of fabric or pliable material supported by a central ~~pole~~pole(s). (see "Tent")

Committee Reason: The proposal was approved based upon the need to recognize these type of structures. The modification simply incorporates the concept of an umbrella structure within the definition for tent as it was felt to be a more simplistic and straightforward approach than placing the term throughout the code.

Assembly Action **None**

Final Action Results

F298-16 **AM**

Code Change No: F329-16

Original Proposal

Section: 3304.5.1 (New); IBC 3314 (New), [F] 3314.1

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

Add new text as follows:

3304.5.1(IBC [F] 3314.1) Fire watch during combustible construction. Where required by the *fire code official*, a fire watch shall be provided during non-working hours for construction that is combustible and exceeds 40 feet in height above the lowest adjacent grade.

2015 International Building Code

Add new text as follows:

SECTION 3314
FIRE WATCH DURING CONSTRUCTION

Reason: This code change was submitted as a public comment to G232-15 in Cycle A however staff indicated that it should be submitted to the Fire Code Committee in Cycle B so it was not considered by the membership.
The code change is submitted after consideration of feedback from the American Wood Council and the Fire Code Action Committee as well as other stakeholders during the committee action hearings in Memphis.
Two issues were raised with the original proposal.

1. The proposal allowing either the Fire Code Official or Building Official to trigger compliance would create a potential conflict since one may trigger the requirement and the other may not.
2. The proposed language is more appropriate for the International fire Code.

Technical merits of the original proposal were well received when considering the other proposals that had been submitted that were significantly more restrictive. The proposed code change recognizes issues prevalent in dense urban communities that are seeing an increase in multi-story combustible construction in close proximity to adjacent properties. This balanced proposal recognizes that the installation of automatic detection and fire extinguishing systems during construction is not practical and that at a minimum early notification for fire department response will improve protection for vulnerable neighboring properties.
The code change will not mitigate the socioeconomic impacts of losses created by such fires, however the proposed code change seeks to minimize the potential damage by initiating faster notification. Additionally the proposal recognizes responsibility for regulating construction, and fire safety during construction, varies between communities and the revised proposal adds the requirement to both the IBC and IFC and identifies the responsible official by code. Many large national developers provide fire watch to protect their investment even for non-combustible buildings when combustible materials are used and placed for future use during project construction. We urge the committee to support this necessary code change as a stop gap measure until a comprehensive research project funded by the wood industry provides more scientific and technically based solutions to the problem of large construction fires in urban areas.

Cost Impact: Will not increase the cost of construction
Most insurers providing coverage during construction require fire watch.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

3304.5.1(IBC [F] 3314.1) Fire watch during combustible construction. Where required by the *fire code official*, a fire watch shall be provided during non-working hours for construction that ~~is combustible and~~ exceeds 40 feet in height above the lowest adjacent grade.

Committee Reason: This proposal provides a necessary trigger to address the need for a fire watch when construction exceeds 40 feet. This is an important tool for the fire code official. The modification more appropriately applies to all construction types and does not limit the type to combustible construction. Fire hazards still exist at construction sights regardless of the type of construction. Also, it was clarified through the addition of the word "new" that this was only intended for new construction. The fire safety plan would address existing buildings. In addition without the term "new" every small alteration could trigger a fire watch inappropriately.

Assembly Action **None**

Final Action Results

F329-16 **AM**

Code Change No: F335-16

Original Proposal

Section: 3311.2 (IBC: [F] 3310.2) (IEBC: [F] 1505.2)

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

Revise as follows:

3311.2 Maintenance. Required *means of egress and accessible means of egress* shall be maintained during construction and demolition, remodeling or *alterations* and additions to any building.

Exception: *Approved* temporary *means of egress and accessible means of egress* systems and facilities.

Reason: In July/2014 the ICC Board decided to sunset the activities of the Code Technology Committee (CTC). This is being accomplished by re-assigning many of the CTC Areas of Study to the applicable Code Action Committee (CAC). This proposal falls under the CTC Area of Study entitled IBC Coordination with the New ADAAG. Information on the CTC, including: the sunset plan; meeting agendas; minutes; reports; resource documents; presentations; and all other materials developed in conjunction with the CTC effort can be downloaded from the CTC website.

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

Buildings that have been constructed after accessible means of egress was required for new construction need to maintain that accessible means of egress in the same way the general means of egress must be maintained both during construction and during occupancy.

Cost Impact: Will not increase the cost of construction
The proposal is a clarification and coordination of current requirements; therefore, there is no impact on the cost.

Report of Committee Action Hearings

Committee Action: **Approved as Modified**

Modify as follows:

3311.2 Maintenance. Required *means of egress and required accessible means of egress* shall be maintained during construction and demolition, remodeling or *alterations* and additions to any building.

Exception: *Approved* temporary *means of egress and accessible means of egress* systems and facilities.

Committee Reason: This proposal was approved based upon the proponent's reason statement. There was also a modification to clarify that it is only the "required" accessible egress that is intended to be maintained.

Assembly Action **None**

Final Action Results

F335-16 **AM**

Code Change No: F340-16

Original Proposal

Section(s): 202 (New), 604.2.17 (New) [IBC [F] 2702.2.17(New)], Chapter 38 (New), 5003.8.3, Chapter 80; IBC [F] 307.1.1, [F] 414.2, [F] 427 (New), Table [F] 903.2.11.6, Chapter 35

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

2015 International Fire Code

Add new text as follows:

CHAPTER 38
HIGHER EDUCATION LABORATORIES

SECTION 3801
GENERAL

3801.1 Scope. *Higher education laboratories* complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the Building Code.

3801.2 Application. The provisions of this chapter shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by this chapter, the storage, use and handling of hazardous materials shall comply with all other provisions in Chapters 50 through 67 and the *International Building Code for quantities not exceeding the maximum allowable quantity*.

SECTION 3802
DEFINITIONS

3802.1 Definitions. The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD
GLOVE BOX
HIGHER EDUCATION LABORATORY
LABORATORY SUITE
SPECIAL EXPERT

SECTION 3803
GENERAL SAFETY PROVISIONS

3803.1 Scope. Laboratories and *laboratory suites* applying the requirements of this chapter shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.

3803.1.1 Chemical Safety Reviews. Operating and emergency procedures planning and documentation shall be provided in accordance with Sections 5001.3.3.11 through 5001.3.3.17. Such documentation shall be prepared by laboratory safety personnel or *special experts*, and shall be made available in the workplace for reference and review by employees. Copies of such documentation shall be made available to the *fire code official* for review upon request.

3803.1.2 Chemical handling. Receiving, transporting on site, unpacking and dispensing of hazardous materials shall be carried out by persons trained in proper handling of such materials and shall be performed in accordance with Chapters 50 through 67, as applicable.

3803.1.3 Warning Signage. Warning signs shall be provided in accordance with Section 5003.5.

3803.1.4 Maintenance of equipment, machinery and processes. Maintenance of equipment, machinery and processes used with hazardous materials shall comply with Section 5003.2.6.

3803.1.5 Time sensitive materials. Containers of materials that have the potential to become hazardous during prolonged storage shall be dated when first opened, and shall be managed in accordance with NFPA 45 Section 8.2.4.4.1.

3803.1.6 Hazardous Wastes. Storage, dispensing, use and handling of hazardous waste shall comply with this chapter and Chapters 50 through 67, as applicable.

3803.1.7 Automatic Fire Extinguishing Systems. New laboratories in new or existing buildings that increase maximum allowable quantities of hazardous materials based upon the requirements in this chapter shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

3803.2 Hazardous materials storage and use. Hazardous Materials storage, handling and use in laboratories and laboratory suites complying with Chapter 38 shall be in accordance with this chapter and Chapters 50 through 67.

3803.2.1 Container Size. The maximum container size for all hazardous materials shall be 5.3 gallons for liquids, 50 pounds for solids, 100 cf. for health hazard gases per table 5003.1.1(2) and 500 cf. for all other gases in accorandance with Table 5003.1.1(1).

> **Exception:** Hazardous waste collection containers, for other than Class I and Class II flammable liquids, are permitted to exceed 5.3 (20L) gallons where approved.

3803.2.2 Density. Quantities of Class I flammable liquids in storage and use shall not exceed 8 gallons per 100 sf of floor areas. Densities shall be reduced by 25% on the 4th through 6th floors of the building and by 50% above the 6th floor. Regardless of the density, the maximum allowable quantity per control area or laboratory suite in accordance with this chapter, shall not be exceeded.

> **Exception:** Designated hazardous waste collection areas or rooms within a *laboratory suite* or *control area* are not limited, but but such materials shall not exceed the maximum allowable quantity per *laboratory suite* or *control area*.

SECTION 3804
LABORATORY SUITE CONSTRUCTION

3804.1 General. Where *laboratory suites* are provided, they shall be constructed in accordance with this chapter, and Section 427 of the *International Building Code*.

3804.1.1 Laboratory Suites. The number of control areas and percentage of maximum allowable quantities of hazardous materials in laboratory suites shall be in accordance with Table 3804.1.1.

TABLE 3804.1.1
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE[a]	NUMBER OF LAB SUITES PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b]
Above Grade Plane	21+	Not allowed	Not Permitted	Not Permitted
	16-20	25	1	2[c]
	11-15	50	1	2[c]
	7-10	50	2	2[c]
	4-6	75	4	1
	3	100	4	1
	1-2	100	6	1
Below Grade Plane	1	75	4	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating laboratory suites from other spaces on the same floor may be one hour rated.

3804.1.1.1 Separation from other non-laboratory areas. *Laboratory suites* shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. Table 3804.1.1 with fire barriers constructed in accordance with Section 707 of the *International Building Code* and horizontal assemblies constructed in accordance with Section 711 of the *International Building Code*.

   Exception: Where an individual *laboratory suite* occupies more than one story, the fire resistance rating of intermediate floors contained within the *laboratory suite* shall comply with the requirements of the *International Building Code*.

2. Section 508 of the International Building Code.

3804.1.1.2 Separation from other Laboratory Suites. *Laboratory suites* shall be separated from other laboratory suites in accordance with Table 3804.1.1.

3804.1.1.3 Floor Assembly Fire Resistance. The floor assembly supporting the *laboratory suite* and the construction supporting the floor of the laboratory suite shall have a fire resistance rating of not less than 2 hours.

Exception: The floor assembly of the *laboratory suite* and the constriction supporting the floor of the laboratory suite are allowed to be 1-hour fire resistance rated in buildings of Types IIA, IIIA and VA construction, provided that the building is 3 or fewer stories.

3804.1.1.4 Maximum number. The maximum number of *laboratory suites* shall be in accordance with Table 3804.1.1. Where a building contains both *laboratory suites* and *control areas* the total number of *laboratory suites* and *control areas* within a building shall not exceed the maximum number of *laboratory suites* in accordance with Table 3804.1.1.

3804.1.1.5 Means of Egress. Means of egress shall be in accordance with Chapter 10.

3804.1.1.6 Standby or emergency power. Standby or emergency power shall be provided in accordance with Section 5004.7 where *laboratory suites* are located above the sixth story above grade plane or located in a story below grade plane.

3804.1.1.7 Ventilation. Ventilation shall be in accordance with Chapter 7 of NFPA 45, and the *International Mechanical Code*.

3804.1.1.8 Liquid tight floor. Portions of the *laboratory suite* where hazardous materials are present shall be provided with a liquid tight floor.

3804.1.1.9 Automatic fire extinguishing systems. Buildings shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

3804.1.2 Percentage of maximum allowable quantity in each laboratory suite. The percentage of maximum allowable quantities in each *laboratory suite* shall be in accordance with Table 3804.1.1.

SECTION 3805
NON-SPRINKLERED LABORATORIES

3805.1 Scope. Storage and use of hazardous materials in existing laboratories located within existing buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, is permitted where such use complies with Section 3803, and with Chapters 50 through 67, as applicable, and Sections 3805.2 through 3805.4.

3805.2 Non-sprinklered laboratories. The maximum allowable quantities of hazardous materials in storage and use in *control areas* in laboratories located in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall be in accordance with Table 5003.1.1(1) and 5003.1.1(2), and Table 5003.8.3.2, except as modified by Sections 3805.2.1 and 3805.2.2.

3805.2.1 Restricted Materials Storage. Where approved by the fire code official, storage of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table 5003.1.1(1) limits for a building equipped throughout with an automatic sprinkler system:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases shall be prohibited, and all such materials shall be stored in accordance with all of the following:

1. Containers shall be completely sealed and stored according to the manufacturer's recommendations.
2. Storage shall be within approved hazardous materials storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11.
3. The storage cabinet or glove box shall not contain any storage of incompatible materials.

3805.2.2 Restricted materials use. Where approved by the fire code official, use of the following hazardous materials prohibited by Table 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table 5003.1.1(1) limits for buildings equipped throughout with an automatic sprinkler system:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases shall be prohibited, and all such materials shall be used in accordance with all of the following:

1. Use shall be within an approved *chemical fumehood* listed in accordance with UL 1805, or in an inert atmosphere *glove box* in accordance with NFPA 45 Section 7.11, or other *approved* equipment designed for the specific hazard of the material.
2. Combustible materials shall be kept at least 0.610 m (2 ft.) away from the work area, except for those items directly related to the research.
3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet of the use in accordance with Section 906.

3805.3 Restricted materials automatic fire detection. An automatic fire detection system shall be installed in all existing laboratories in non-sprinklered buildings in accordance with this section. Detectors shall be connected to the building's fire alarm control unit where a fire alarm system is provided. Detector initiation shall activate the occupant notification system in accordance with Section 907.5 where connected to the building's fire alarm control unit. Activation of the detection system shall sound a local alarm in buildings not equipped with a fire alarm notification system,

3805.3.1 System supervision and monitoring. Automatic fire detection systems shall be electronically supervised and monitored by an *approved* supervising station or, where *approved*, shall initiate an audible and visual signal at a constantly attended on-site location.

3805.4 Percentage of maximum allowable quantity per control area. The percentage of maximum allowable quantities per *control area* shall be permitted to be increased in accordance with Table 3805.4.

TABLE 3805.4
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NON-SPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	NUMBER OF CONTROL AREAS PER FLOOR	FIRE RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[c,d]
Above grade plane	Higher than 9	5%	1	2
	7-9	10%	2	2
	4-6	25%	2	2
	3	75%	2	1
	1-2	100%	4	1
Below Grade Plane	1	100%	3	1
	2	75%	2	1
	Lower than 2	Not allowed	Not Allowed	Not allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), excluding all increases allowed in the footnotes to those tables
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building
c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one hour rated.
d. See *International Building Code* Section 414.2.4 for additional requirements.

SECTION 3806
EXISTING SPRINKLERED LABORATORIES

3806.1 Scope. Storage and use of hazardous materials in existing laboratories within buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be in accordance with Section 3803, and with Chapters 50-67 as applicable, except as modified by this section.

3806.2 Hazardous materials storage and use. Storage and use of hazardous materials within control areas in new and existing sprinklered laboratories shall be in accordance with this section and Chapters 50 through 67, as applicable.

Exception: Existing laboratories in buildings equipped though with an automatic sprinkler meeting requirements for laboratory suites are permitted to comply with Section 3804.

3806.2.1 Percentage of maximum allowable quantity per control area. The percentage of maximum allowable quantities per control area shall be in accordance with Table 3806.2.1.

TABLE 3806.2.1
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING SPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a]	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b,d]
Above Grade Plane	21+	5	1	2[c]
	11-20	10	1	2[c]
	7-10	25	2	2[c]
	4-6	50	2	2[c]
	3	75	3	1
	1-2	100	4	1
Below Grade Plane	1	75	3	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one-hour rated.
d. See *International Building Code* Section 414.2.4 for additional requirements.

5003.8.3 Control areas. *Control areas* shall comply with Sections 5003.8.3.1 through 5003.8.3.5.

Exception: Higher education laboratories in accordance with Chapter 38 and Section 427 of the *International Building Code*.

604.2.17 (IBC[F] 2702.2.17 Laboratory suites. Higher education l*aboratory suites* shall be provided with emergency or standby power in accordance with Section 3804.11.6.

Add new definitions as follows:

CHEMICAL FUME HOOD. A ventilated enclosure designed to contain and exhaust fumes, gases, vapors, mists and particulate matter generated within the hood.

GLOVE BOX. A sealed enclosure in which items inside the box are handled exclusively using long gloves sealed to ports in the enclosure.

HIGHER EDUCATION LABORATORY Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a non-production basis.

LABORATORY SUITE. A fire-rated enclosed laboratory area that will provide one or more laboratory spaces, within a Group B educational occupancy, that are permitted to include ancillary uses such as offices, bathrooms, and corridors that are contiguous with the laboratory area, and are constructed in accordance with section 3804.

SPECIAL EXPERT. An individual who has demonstrated qualifications in a specific area, outside the practice of architecture or engineering, through education, training and experience.

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[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 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code.*
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol storage shall be classified as Group S-1, provided that such buildings conform to the requirements of the *International Fire Code*.
13. Display and storage of nonflammable solid and nonflammable or noncombustible liquid hazardous materials in quantities not exceeding the maximum allowable quantity per *control area* in Group M or S occupancies complying with Section 414.2.5.
14. The storage of black powder, smokeless propellant and small arms primers in Groups M and R-3 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the *International Fire Code*.
15. Group B Higher Education Laboratory occupancies complying with Section 427 and Chapter 38 of the IFC.

[F] 414.2 Control areas. *Control areas* shall comply with Sections 414.2.1 through 414.2.5 and the *International Fire Code*.

Exception: Higher education laboratories in accordance with Section 427 and Chapter 38 of the International Fire Code.

SECTION 427
HIGHER EDUCATION LABORATORIES

[F]427.1 Scope. *Higher education laboratories* complying with the requirements of Sections 427.1 through 427.4 shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Tables 307.1(1) and 307.1(2) without requiring classification as a Group H occupancy. Except as specified in Sections 427.1 through 427.4, such laboratories shall comply with all applicable provisions of this code and the the *International Fire Code*.

[F]427.2 Application. The provisions of Sections 427.1 through 427.4 shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by Sections 427.1 through 427.4, the storage, use and handling of hazardous materials shall comply with all other provisions in Chapters 38, and 50 through 67 of the *International Fire Code* and this code for quantities not exceeding the maximum allowable quantity.

[F]427.3 Laboratory suite construction. Where laboratory suites are provided, they shall be constructed in accordance with this Section and Chapter 38 of the *International Fire Code*. The number of control areas and percentage of maximum allowable quantities of hazardous materials in laboratory suites shall be in accordance with Table 427.3.

[F]427.3.1 Separation from other non-laboratory areas. Laboratory suites shall be separated from other portions of the building in accordance with the most restrictive of the following:

1. Table 427.3 with fire barriers constructed in accordance with Section 707 oand horizontal assemblies constructed in accordance with Section 711.

   Exception: Where an individual laboratory suite occupies more than one story, the fire resistance rating of intermediate floors contained within the laboratory suite shall comply with the requirements of this code.

2. Section 508 of the International Building Code.

[F]427.3.2 Separation from other Laboratory Suites. Laboratory suites shall be separated from other laboratory suites in accordance with Table 427.3.

[F]427.3.3 Floor Assembly Fire Resistance. The floor assembly supporting the laboratory suite and the construction supporting the floor of the laboratory suite shall have a fire resistance rating of not less than 2 hours.

Exception: The floor assembly of the laboratory suite and the constriction supporting the floor of the laboratory suite are allowed to be 1-hour fire resistance rated in buildings of Types IIA, IIIA and VA construction, provided that the building is 3 or fewer stories.

[F]427.3.4 Maximum number. The maximum number of laboratory suites shall be in accordance with Table 427.3. Where a building contains both laboratory suites and control areas the total number of laboratory suites and control areas within a building shall not exceed the maximum number of laboratory suites in accordance with Table 427.3.

[F]427.3.5 Means of egress. Means of egress shall be in accordance with Chapter 10.

[F]427.3.6 Standby or emergency power. Standby or emergency power shall be provided in accordance with Section 5004.7 where laboratory suites are located above the sixth story above grade plane or located in a story below grade plane.

[F]427.3.7 Ventilation. Ventilation shall be in accordance with Chapter 7 of NFPA 45, and the *International Mechanical Code*.

[F]427.3.8 Liquid tight floor. Portions of the laboratory suite where hazardous materials are present shall be provided with a liquid tight floor.

[F]427.3.9 Automatic fire extinguishing systems. Buildings shall be equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

[F]427.4 Percentage of maximum allowable quantity in each laboratory suite. The percentage of maximum allowable quantities in each laboratory suite shall be in accordance with Table 427.3

TABLE [F] 903.2.11.6
ADDITIONAL REQUIRED SUPPRESSION SYSTEMS

SECTION	SUBJECT
402.5, 402.6.2	Covered and open mall buildings
403.3	High-rise buildings
404.3	Atriums
405.3	Underground structures
407.6	Group I-2
410.7	Stages
411.4	Special amusement buildings
412.3.6	Airport traffic control towers
412.4.6, 412.4.6.1, 412.6.5	Aircraft hangars
415.11.11	Group H-5 HPM exhaust ducts
416.5	Flammable finishes
417.4	Drying rooms
419.5	*Live/work units*
424.3	Children's play structures
427.	Buildings containing laboratory suites
507	Unlimited area buildings
509.4	Incidental uses
1029.6.2.3	Smoke-protected assembly seating
IFC	Sprinkler system requirements as set forth in Section 903.2.11.6 of the *International Fire Code*

SECTION 202
DEFINITIONS

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

TABLE [F]427.3
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE[a]	NUMBER OF LAB SUITES PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b]
Above Grade Plane	21+	Not allowed	Not Permitted	Not Permitted
	16-20	25	1	2[c]
	11-15	50	1	2[c]
	7-10	50	2	2[c]
	4-6	75	4	1
	3	100	4	1
	1-2	100	6	1
Below Grade Plane	1	75	4	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating laboratory suites from other spaces on the same floor shall be permitted to be one hour rated.

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

NFPA 45 - 2015: Standard On Fire Protection For Laboratories Using Chemicals
UL 1805 - 2002 Standard for Laboratory Hoods and Cabinets

Reason: There is quite possibly no industry more important to lives across the world than higher education academic institutions. The advance of technologies, science, medicine and our knowledge of the world often relies on having vibrant and successful academic institutions.

These academic institutions often have chemistry, biology, medical, engineering and other laboratories where hazardous materials are used. The IFC does not specifically address teaching and research laboratories, so users must try to apply general hazardous materials provisions, which oftentimes are not appropriate for specialized academic laboratory settings.

The following is a list of several conditions typically present in academic laboratories that make them unique:

1. Lower chemical density in individual research laboratories. In a teaching and research environment, there are often many small laboratories within a building that are using small quantities of hazardous materials in each location. Individually, they do not store or use a large quantity of hazardous materials, but together, they may often exceed the maximum allowable quantities for the control area. This lower chemical density often mitigates the overall risk, but the IFC currently has no provisions to recognize this condition.
2. Ongoing staff oversight from "Special Experts" in laboratory safety. Many higher education institutions have a full cadre of faculty and staff with chemical expertise. These "Special Experts" often include, but are not limited to: Fire Marshals, Industrial Hygienists, Radiation Safety Officers, Biological Safety Officers, Chemical Hygiene Officers and Environmental Health and Safety Officers. These individuals are an integral part of the preparation/review of laboratory safety documentations, as well as regularly scheduled safety audits. Fire and life safety expertise and oversight on our campuses is continually increasing with the addition of these highly capable professionals.
3. Limited, or "directed", funding streams. Also unique to academic institutions are the funding sources for research. In a "non-profit" teaching and research environment, the majority of research is funded through grants and endowments. Unfortunately, many grants only support the costs of research personnel and equipment, not structural upgrades to accommodate newer research processes.
4. Mixed-use occupancies. A typical university science building will house laboratories, office space, storerooms, classrooms and lecture halls. The current limits on hazardous materials are so restrictive on upper floors that many universities are forced to locate classrooms and lecture halls on the upper floors so that they can take full advantage of the hazardous materials quantities allowed on the lower floors. This results in moving large numbers of students through hallways, past laboratories to get to the upper floors. They will also have to exit back down the same routes in the event of an emergency.
This proposal introduces a post-secondary academic laboratory chapter to address these unique circumstances. University fire and life safety professionals from across the United States have collaborated on writing this chapter. Conscientious effort has been made to balance the proposed IFC modifications with enhanced administrative, emergency planning and structural provisions.
This chapter also introduces some important provisions from NFPA 45, Fire Protection for Laboratories. Although the IFC references many national standards on specific topics, there are no such references currently for laboratories. This standard contains many laboratory specific requirements and design professionals rely heavily upon this national standard for current laboratory designs.
Specifically, the chapter addresses three primary needs: 1) increasing general laboratory safety requirements, 2) increasing MAQ's in large or multi-story laboratories, or laboratories located in multi-story buildings and, 3) allowing very small quantities of currently prohibited hazardous materials in non-sprinklered laboratory buildings. A brief description of each is as follows:

1. Increased general laboratory safety requirements: This proposal introduces a post-secondary academic laboratory chapter in to the IFC. Currently, there is no teaching/research laboratory specific chapter in the IFC, and there are no references to NFPA 45 (Fire Protection for Laboratories). This new chapter fills a much needed gap in the IFC, and provides for enhanced safety requirements in these academic laboratories.
2. Control Area Limitations: As post-secondary campuses across the world grow to meet increasing populations, they often are landlocked, and require that new buildings are built taller and/or larger. This is particularly true in large metropolitan areas. The current "Control Area" restrictions in the ICC codes severely restrict functioning laboratories on upper floor levels or in larger buildings.
In response to this critical issue, numerous jurisdictions have adopted state or local amendments to allow for greater numbers of control areas and larger percentages of MAQs in academic and /or non-production laboratories. Such jurisdictions include California, Arizona, Minnesota, Seattle and New York City. One of the primary purposes of this proposal is to provide standardized model code language to address this topic.
This chapter provides an alternate design approach for such scenarios where traditional control area limitations are not feasible, and where building Group H-Occupancies is not possible. The "Laboratory Suite" concept gives users an option to

allow more flexibility in hazardous materials use, in exchange for additional administrative and structural safeguards, while still remaining a "B" occupancy.

3. Non-Sprinklered Limitations: There are thousands of existing post-secondary academic institutions, with some dating back to 1800's, where retrofitting automatic sprinklers is not practical. This proposal addresses a critically important issue to selected laboratories in existing, non-sprinklered buildings, who need very small quantities of materials that have blanket restrictions in non-sprinklered buildings. This proposal provides a limited exception to allow very small quantities of such materials when specific mitigation controls are provided.

PART 1 REASON:

Section 3801. Provides general scoping information. It clarifies that the chapter applies to both existing laboratories in existing buildings and new laboratories as referenced in the sections.

The definition used for laboratories mirrors the definition found in the International Mechanical Code, with the addition of language to clarify that the chapter is limited to "Laboratories in higher education institutions beyond the 12th grade".

Section 3802. Provides definitions for new terms introduced in this chapter. The term "Special Expert" is in the International Performance Code in the appendix. It was utilized in this chapter to reflect the high level of faculty and staff safety professionals available at many academic institutions.

Section 3803. Requires additional safety pre-planning for all laboratories or laboratory suites utilizing this chapter, also consistent with laboratory safeguards found in NFPA 45. Enhanced safety requirements found in this section include:

1. New hazard analysis documentation shall include: Process Hazard Analysis, Pre-startup Safety Review, Operating and Emergency Procedures, Management of Change, Accident Procedures, Consequence Analysis and Safety Audits. Requires that such documentation shall be submitted to the fire code official. (IFC Section 5001)
2. Time-sensitive materials shall be dated and pro-actively managed. (NFPA 45)
3. Maximum container size of Class I flammable liquids is 5.3 gallons. (NFPA 45)
4. Density of Class I flammable liquids in storage and use shall be no greater than 8 gallons per 100 square feet of floor area. (NFPA45)

Section 3804. Provides the "Laboratory Suite" design option in addition to traditional control area options. Enhanced safety requirements in this section include:

1. All of those listed above in in section 3803
2. Rated fire barriers for compartmentation of laboratory suites within buildings.
3. In laboratories above the 6th story, or in a story below grade plane, requirements for standby or emergency power for safety-related equipment and enhanced automatic sprinkler protection.
4. Automatic sprinkler design and density exceeding that which would be required by NFPA 45.

If the vertical fire barrier between lab suites is required to be two-hour rated, a fire rated duct enclosure, UL listed duct wrap, or multiple building shafts is required. Footnote c in the table allows the vertical fire barriers between laboratory suites on a floor to be one-hour rated because of the reduced quantities of hazardous materials in each laboratory suite on the floors above the 6th story, and additional safety provisions in Chapter 38 which apply to all laboratories utilizing this chapter. In addition, chemical exhaust ducts routed through the one-hour rated barriers would be permitted to be installed without fire dampers, where the duct needs to be routed to the nearest chemical exhaust shaft. Fire dampers are not installed in laboratory exhaust ducts to maintain exhaust ventilation in laboratories in the event of a fire. In the IBC, section 714.1.1 and section 717.5.2, exception 3; and IMC 607.5.5 allow exhaust system ducts to penetrate fire rated barriers and fire rated shafts without a fire damper. These provisions carry significant importance and allow multiple laboratory suites per floor of a building. The footnote has no effect on other provisions of the code and does not change the structural fire resistance requirements of IBC Chapter 6, or the continuity requirements of IBC Chapter 7.

Historical fire data over the last 25 years has shown that the vast majority of laboratory fires do not typically extend beyond the area, or even the room of origin. This is primarily due to the limited quantities of hazardous materials in use, and the following safety features that are incorporated into laboratory designs:

1. Ventilation systems provide large volumes of airflow through laboratories to continuously remove hazardous vapors, fumes and gases.
2. Fume hoods provide local ventilation control for containment and removal of hazardous vapors, fumes and gases during the use of hazardous materials.
3. Automatic fire sprinkler systems can confine the fires to the room of origin
4. Fire alarm systems provide prompt notification to building occupants and/or emergency responders.

All of these structural safety features are required in some combination in laboratories utilizing this chapter, as well as the additional NFPA 45 requirements for monitoring of time-sensitive materials, limitations on container sizes and limiting the density of flammable liquids over the floor area of laboratory space.

Section 3805. Provides and clarifies general hazardous materials requirements for non-sprinklered laboratories. Provides an option to allow for very small quantities of prohibited materials in non-sprinklered laboratories. Enhanced safety requirements in this section include:

1. All of those listed above in section 3803
2. Enhanced storage requirements in accordance with NFPA 45
3. Prohibition of storage of any incompatible materials.
4. Use of hazardous materials use must be in a chemical fume hood, glove box or other approved laboratory equipment designed for the specific hazard.
5. The work area must be free of all unnecessary combustible materials
6. There must be an appropriate extinguishing media located within 20 feet.

Section 3806. Provides requirements for existing laboratories in existing sprinklered buildings. Enhanced safety requirements in this section include all of those in section 3803, including complete hazard analysis and safety audits, and limits on container sizes for all hazardous materials and density limits on flammable liquids.

PART 2 REASON:

Modifies IBC 414.2 to identify that "Laboratory Suites" are an exception to traditional control area provisions.

PART 3 REASON:

Modifies IFC 604.2 to identify that "Laboratory Suites" require emergency or standby power.

PART 4 REASON:

Adds NFPA 45 as recognized standard.

This chapter was written and reviewed by a national taskforce made up of fire and life safety professionals from colleges, universities, municipal fire organizations and private industry across the United States. Taskforce members are individuals representing their own institutions, as well as members who were assigned participants by national college and university safety associations.

National endorsements:

Campus Safety, Health, and Environmental Management Association (CSHEMA)

Center for Campus Fire Safety (CCFS)

Chapter 38 Taskforce

Taskforce Chairperson – Morgana Yahnke, University of California, Davis

University Representatives:

Zachary Adams, Virginia Polytechnic Institute and State University and designated representative for Campus Safety, Health, and Environmental Management Association (CSHEMA)
Dwain Archer, University of Louisville
Jason Ellis, University of Kentucky, Principal Voting Member – NFPA 45
Todd Griffin, University of South Carolina
William Guffey, University of Maryland and designated representative for the Center for Campus Fire Safety (CCFS)
Megan Hall, University of California, Berkeley
Scott Jackson, University of California, Irvine
Joseph Klancher, University of Minnesota
Ken Kretchman, North Carolina State University
Paige McKibbin, University of California, Davis
Mark Murray, University of Washington and designated representative for Campus Safety, Health, and Environmental Management Association (CSHEMA)
Dale Saunders, University California, Irvine
Anthony Yuen, University of California, Berkeley

Municipal and private fire and life safety professionals:

Steve Forster, Tualatin Valley Fire & Rescue
Reinhard Hanselka, CRB
Pat McLaughlin, McLaughlin & Associates
Andrew Minister, Pacific Northwest National Laboratory, Chairperson – NFPA 45
Lynn Nielson, City of Henderson, Nevada
Kenney Payne, Moseley Architects

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

Comparison of the storage MAQ allowances and number of control areas for Class 1B Flammable Liquids			
	2015 International Fire Code B Occupancy [a]	**Chapter 38: MAQ in Existing Non-Sprinklered Labs** B Occupancy [a]	**Chapter 38: MAQ in Existing Sprinklered Labs** B Occupancy [a]
Floor Level	% of MAQ times # of Control areas = total volume per floor	% of MAQ times # of Lab Suites = total volume per floor	% of MAQ times # of Control areas = total volume per floor
21+	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**
16-20	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**	10 % x 1 = **12 gal**
15	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**	10 % x 1 = **12 gal**
11-14	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**	10 % x 1 = **12 gal**
10	5 % x 1 = **6 gal**	5 % x 1 = **6 gal**	25 % x 2 = **60 gal**
9	5 % x 2 = **12 gal**	10 % x 2 = **24 gal**	25 % x 2 = **60 gal**
8	5 % x 2 = **12 gal**	10 % x 2 = **24 gal**	25 % x 2 = **60 gal**
7	5 % x 2 = **12 gal**	10 % x 2 = **24 gal**	25 % x 2 = **60 gal**
6	12.5 % x 2 = **30 gal**	25 % x 2 = **60 gal**	50 % x 2 = **120 gal**
5	12.5 % x 2 = **30 gal**	25 % x 2 = **60 gal**	50 % x 2 = **120 gal**
4	12.5 % x 2 = **30 gal**	25 % x 2 = **60 gal**	50 % x 2 = **120 gal**
3	50 % x 2 = **120 gal**	75 % x 2 = **180 gal**	75% x 3 = **270 gal**
2	75 % x 3 = **270 gal**	100 % x 4 = **480 gal**	100% x 4 = **480 gal**
1	100 % x 4 = **480 gal**	100 % x 4 = **480 gal**	100% x 4 = **480 gal**
Below Grade 1[b]	75 % x 3 = **67.5 gal**	100 % x 3 = **0 gal**	100% x 3 = **90 gal**
Below Grade 2[b]	50 % x 2 = **30 gal**	75 % x 2 = **0 gal**	75% x 2 = **45 gal**
Lower than 2	Not Allowed	Not Allowed	Not Allowed

[a] Listed volumes do not include increases allowed for sprinklers or reflect increases for storage within a flammable cabinet
[b] Class 1 liquids shall be allowed to be stored in basements in amounts not exceeding the MAQ for use-open systems from Table 5003.1.1(1) provided that automatic fire suppression and other fire protection features are in accordance with Chapter 9.

Comparison of the MAQ allowances and number of control areas for Class 1B Flammable Liquids			
	2015 International Fire Code B Occupancy [a]	2013 California Building Code L Occupancy [b]	Chapter 38: MAQ in Laboratory Suites B Occupancy [a]
Floor Level	% of MAQ times # of Control areas = total volume per floor	% of MAQ times # of Lab Suites = total volume per floor	% of MAQ times # of Lab Suites = total volume per floor
21+	5 % x 1 = **12 gal**	0 % = **0 gal**	0 % = **0 gal**
16-20	5 % x 1 = **12 gal**	25 % x 4 = **120 gal**	25 % x 1 = **60 gal**
15	5 % x 1 = **12 gal**	25 % x 4 = **120 gal**	50 % x 1 = **120 gal**
11-14	5 % x 1 = **12 gal**	50 % x 8 = **480 gal**	50 % x 1 = **120 gal**
10	5 % x 1 = **12 gal**	50 % x 16 = **960 gal**	50 % x 2 = **240 gal**
9	5 % x 2 = **24 gal**	50 % x 16 = **960 gal**	50 % x 2 = **240 gal**
8	5 % x 2 = **24 gal**	50 % x 16 = **960 gal**	50 % x 2 = **240 gal**
7	5 % x 2 = **24 gal**	50 % x 16 = **960 gal**	50 % x 2 = **240 gal**
6	12.5 % x 2 = **60 gal**	75 % x 20 = **1,800 gal**	75 % x 4 = **720 gal**
5	12.5 % x 2 = **60 gal**	75 % x 20 = **1,800 gal**	75 % x 4 = **720 gal**
4	12.5 % x 2 = **60 gal**	75% x 20 = **1,800 gal**	75 % x 4 = **720 gal**
3	50 % x 2 = **240 gal**	100% **Unlimited**	100 % x 4 = **960 gal**
2	75 % x 3 = **540 gal**	100% **Unlimited**	100 % x 6 = **1,440 gal**
1	100 % x 4 = **960 gal**	100% **Unlimited**	100 % x 6 = **1,440 gal**
Below Grade 1[c]	75 % x 3 = **130 gal**	75 % x 10 = **225 gal**	75 % x 4 = **180 gal**
Below Grade 2[c]	50 % x 2 = **60 gal**	50 % x 5 = **75 gal**	50 % x 2 = **60 gal**
Lower than 2	Not Allowed	Not Allowed	Not Allowed

[a] Listed volumes indicate increases allowed for automatic fire sprinklers only, not increased allowances for storage within a flammable cabinet.
[b] Allowable hazardous material increases for automatic fire sprinklers are not applicable for L occupancies. Volumes listed do not reflect increased allowance for storage within flammable cabinet
[c] Class 1 liquids shall be allowed to be stored in basements in amounts not exceeding the MAQ for use-open systems from Table 5003.1.1(1) provided that automatic fire suppression and other fire protection features are in accordance with Chapter 9.

Cost Impact: Will increase the cost of construction
The code change proposal will increase the cost of construction for those entities choosing to voluntarily comply with the requirements of this chapter.

Analysis: A review of the standard(s) proposed for inclusion in the code, NFPA 45-2015 and UL 1805 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 1, 2016.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved as it provides the necessary provisions for laboratories in Group B occupancies used for educational purposes above the 12th grade. Such facilities are highly regulated and more flexibility for their unique use of hazardous materials is necessary. The concept of providing a specific chapter on the topic was felt consistent with that created for the semi conductor industry. The committee did encourage the broadening of this concept beyond non production laboratories and suggested such collaboration. In particular this is a concept of interest to hospitals.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

2015 International Fire Code

604.2.17 (IBC[F] 2702.2.17) Laboratory suites. ~~Laboratory suites~~ Higher education *laboratory* *suites* shall be provided with emergency or standby power in accordance with ~~Chapter 38~~ Section 3804.11.6.

Commenter's Reason: This public comment references the exact section for emergency or standby power requirements, rather than the broader Chapter 38 reference.

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

Analysis: Note that this section will be renumbered within Section 604.2 of the IFC and Section 2702.2 of the IBC to be within alphabetical order to be consistent with the current content of those sections.

Public Comment 2:

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

Modify as follows:

2015 International Fire Code

SECTION 202
DEFINITIONS

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

3801.1 Scope. ~~Laboratories in Group B occupancies used for educational purposes above the 12th grade~~ *Higher education laboratories* complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the Building Code. ~~Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.~~

3802.1 Definitions. The following terms are defined in Chapter 2:

CHEMICAL FUME HOOD
GLOVE BOX
HIGHER EDUCATION LABORATORY
LABORATORY SUITE
SPECIAL EXPERT

2015 International Building Code

SECTION 202 D
EFINITIONS

HIGHER EDUCATION LABORATORY. Laboratories in Group B occupancies used for educational purposes above the 12th grade. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

[F]427.1 Scope. ~~Laboratories in Group B occupancies used for educational purposes above the 12th grade~~ *Higher education laboratories* complying with the requirements of this chapter shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in Chapter 50 without requiring classification as a Group H occupancy. Except as specified in this chapter, such laboratories shall comply with all applicable provisions of this code and the *International Fire Code*. ~~Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.~~

Commenter's Reason: "Higher Education Laboratory" is a specific use, not an occupancy type, and a definition was needed to clarify the intended application of the provisions in Chapter 38.

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

Public Comment 3:

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

Modify as follows:

2015 International Fire Code

~~3803.1.7 Ventilation.~~ ~~Ventilation for laboratories and laboratory equipment shall be designed and installed in accordance with the requirements in the International Mechanical Code and Chapter 7, NFPA 45.~~

Commenter's Reason: These ventilation requirements were incorrectly included in this "General" section, although they are only intended to apply to new laboratories, not both new and existing laboratories. The requirements are also correctly included in the *Laboratory Suite* section 3804.1.1.7.

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

Public Comment 4:

Michael O'Brian (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Fire Code

3805.2.1 Restricted Materials Storage. ~~Storage~~ Where approved by the fire code official, storage of the following hazardous materials prohibited by Table ~~5003.1.1~~ 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table ~~5003.1.1~~ 5003.1.1(1) limits for a building equipped throughout with an automatic sprinkler system, with no additional:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases ~~allowed~~ shall be prohibited, ~~provided that~~ and all such materials ~~are~~ shall be stored in accordance with all of the following:

1. Containers shall be completely sealed and stored according to the manufacturer's recommendations.
2. Storage shall be within approved hazardous materials storage cabinets in accordance with Section 5003.8.7, or shall be located in an inert atmosphere glove box in accordance with NFPA 45 Section 7.11.
3. The storage cabinet or glove box shall not contain any storage of incompatible materials.

3805.2.2 Restricted materials use. ~~Use~~ Where approved by the fire code official, use of the following hazardous materials prohibited by Table ~~5003.1.1~~ 5003.1.1(1) in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be allowed within a laboratory control area at 25% of Table ~~5003.1.1~~ 5003.1.1(1)

limits for buildings equipped throughout with an automatic sprinkler system~~, with no additional~~:

1. Pyrophorics
2. Class 4 Oxidizers

Additional quantity increases ~~allowed~~ shall be prohibited, ~~provided that~~ and all such materials ~~are~~ shall be used in accordance with all of the following:

1. Use shall be within an approved *chemical fumehood* listed in accordance with UL 1805, or in an inert atmosphere *glove box* in accordance with NFPA 45 Section 7.11, or other *approved* equipment designed for the specific hazard of the material.
2. Combustible materials shall be kept at least 0.610 m (2 ft.) away from the work area, except for those items directly related to the research.
3. A portable fire extinguisher appropriate for the specific material shall be provided within 20 feet of the use in accordance with Section 906.

Commenter's Reason: As written, this section allowed all five classes of hazardous materials that are currently restricted from use/storage in a non-sprinkled building. Based upon feedback from fire service professionals, this section is being made more restrictive in two ways:

1. The phrase, "When approved by the fire code official," has been added to the section to emphasize that these materials are only allowed in these laboratories when specifically approved by the fire code official and,
2. The materials allowed are limited to exclusively Pyrophorics and Class 4 Oxidizers. These are the most commonly needed material classifications that can be used safely within the parameters of this chapter.

There was also a minor editorial correction to reflect the correct table number referenced in Chapter 50.

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

Public Comment 6:

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

Modify as follows:

2015 International Fire Code

3806.1 Scope. Storage and use of hazardous materials in ~~new and~~ existing laboratories ~~in~~ within buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, shall be in accordance with Section 3803, and with Chapters 50-67 as applicable, except as modified by this section.

Commenter's Reason: By striking the word "new", this public comment is intended to clarify that this section applies only to existing laboratories.

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

Public Comment 7:

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

Modify as follows:

2015 International Fire Code

TABLE 3806.2.1
DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING SPRINKLERED LABORATORIES

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a]	NUMBER OF CONTROL AREAS PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b,d]
Above Grade Plane	21+	~~5%~~	1	2[c]
	11-20	~~10%~~	1	2[c]
	7-10	~~25%~~	2	2[c]
	4-6	~~50%~~	2	2[c]
	3	~~75%~~	3	1
	1-2	~~100%~~	4	1
Below Grade Plane	1	~~100%~~75	3	1
	2	~~75%~~50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating control areas from other spaces on the same floor shall be permitted to be one-hour rated.
d. See *International Building Code* Section 414.2.4 for additional requirements.

Commenter's Reason: This public comment corrects four data-entry errors on this table:

1. It adds footnotes c which was inadvertently omitted.
2. it removes footnote d (formally c) from the the last sentence of footnote b and places it correctly as footnote d.
3. It removes the footnote c from applying more generally as the reduction to 1 hour would only be applicable to the 2 hour fire resistance rating for fire barriers.
4. It removes the percentage symbols from the values within columns.

It also reduces the proposed below grade MAQ percentages to remain consistent with current IFC MAQ's per control area.
This public comment is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014, 2015 and 2016 the Fire-CAC has held 7 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Public Comment 8:

Michael O'Brian (fcac@iccsafe.org) requests Approve as Modified by this Public Comment.

Modify as follows:

2015 International Building Code

[F]427.1 Scope. Laboratories in Group B occupancies used for educational purposes above the 12th grade complying with the requirements of ~~this chapter~~ Sections 427.1 through 427.4 shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas set forth in ~~Chapter 50~~ Tables 307.1(1) and 307.1(2) without requiring classification as a Group H occupancy. Except as specified in ~~this chapter~~ Sections 427.1 through 427.4, such laboratories shall comply with all applicable provisions of this code and the *International Fire Code*. Storage, use and handling of chemicals in such laboratories shall be limited to purposes related to testing, analysis, teaching, research or developmental activities on a nonproduction basis.

[F]427.2 Application. The provisions of ~~this chapter~~ Sections 427.1 through 427.4 shall be applied as exceptions or additions to applicable requirements of this code. Unless specifically modified by ~~this chapter~~ Sections 427.1 through 427.4, the storage, use

and handling of hazardous materials shall comply with all other provisions in Chapters 38, and 50 through 67 of the *International Fire Code* and this code for quantities not exceeding the maximum allowable quantity.

Commenter's Reason: The original scope and application language was copied from Chapter 38 in the IFC, but was not adjusted to reflect that it was residing in the International Building Code. These revisions correct the code reference errors in the language to reflect appropriate IFC and IBC references.

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

Public Comment 9:

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

Modify as follows:

TABLE [F]427.3
DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR

FLOOR LEVEL		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER LAB SUITE[a]	NUMBER OF LAB SUITES PER FLOOR	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b]
Above Grade Plane	21+	Not allowed	Not Permitted	Not Permitted
	16-20	25	1	2[c]
	11-15	50	1	2[c]
	7-10	50	2	2[c]
	4-6	75	4	1
	3	100	4	1
	1-2	100	6	1
Below Grade Plane	1	75	4	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Fire barriers shall include walls, floors and ceilings necessary to provide separation from other portions of the building.
c. Vertical fire barriers separating laboratory suites from other spaces on the same floor shall be permitted to be one hour rated.

Commenter's Reason: Table 3804.1.1, Design and Number of Laboratory Suites per Floor was referenced in the original proposal and intended to be reproduced in the International Building Code in section 427.3. It was inadvertently omitted from the original proposal and is included here as the appropriate reference table numbered 427.3.

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

Final Action Results

F340-16 **AMPC2**

F340-16

[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.

15. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined at Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

Code Change No: F345-16

Original Proposal

Section: Table 5003.1.1, Table 5003.11.1, 6303.1.1.2; IBC [F] Table 307.1(1), [F] Table 414.2.5

Proponent: Patrick McLaughlin, Axiall, representing Axiall (pmclaugma@aol.com)

Revise as follows:

TABLE 5003.1.1 (IBC [F]TABLE 307.1(1)) (1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibers[q]	Loose Baled[o]	H-3	(100) (1,000)	NA	NA	(100) (1,000)	NA	NA	(20) (200)	NA
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d,e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Consumer fireworks	1.4G	H-3	125[e, l]	NA	NA	NA	NA	NA	NA	NA
Cryogenic Flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic Oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[d, e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e,g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable	Gaseous	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d, e]	NA	NA

gas	Liquefied			(150)[d, e]	NA		(150)[d, e]	NA		
Flammable liquid[c]	IA IB and IC	H-2 or H-3	NA	30[d, e] 120[d, e]	NA	NA	30[d] 120[d]	NA	NA	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert Gas	Gaseous Liquefied	NA NA	NA NA	NA NA	NL NL	NA NA	NA NA	NL NL	NA NA	NA NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e,f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous Liquefied	H-3	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3 2 1	H-2 H-3 NA	5[d, e] 50[d, e] NL	(5)[d, e] (50)[d, e] NL	NA	5[d] 50[d] NL	(5)[d] (50)[d] NL	NA	1[d] 10[d] NL	(1)[d] (10)[d] NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d also applies, the increase for both notes shall be applied accumulatively.

f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.

h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.

i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2.

j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.

k. A maximum quantity of ~~200~~ 220 pounds of solid or ~~20~~ 22 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.

l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is

not known, 25 percent of the gross weight of the fireworks including packaging shall be used.
m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.
n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.
o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
p. The following shall not be included in determining the maximum allowable quantities:
1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
3. Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.
4. Liquid fuels in piping systems and fixed appliances, regulated by the International Mechanical Code.
5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.
q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2.

TABLE 5003.11.1 (IBC [F] 414.2.5)
MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS[d, e, f]

CONDITION		MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA	
Material[a]	**Class**	**Solids pounds**	**Liquids gallons**
A. HEALTH-HAZARD MATERIALS—NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS			
1. Corrosives[b, c]	Not Applicable	9,750	975
2. Highly Toxics	Not Applicable	20[b, c]	2[b, c]
3. Toxics[b, c]	Not Applicable	1,000	100
B. PHYSICAL-HAZARD MATERIALS—NONFLAMMABLE AND NONCOMBUSTIBLE SOLIDS AND LIQUIDS			
1. Oxidizers[b, c]	4	Not Allowed	Not Allowed
	3	1350 ~~1,150~~[g]	135 ~~115~~
	2	2,250[h]	225
	1	18,000[i, j]	1,800[i, j]
2. Unstable (Reactives)[b, c]	4	Not Allowed	Not Allowed
	3	550	55
	2	1,150	115
	1	Not Limited	Not Limited
3. Water Reactives	3[b, c]	550	55
	2[b, c]	1,150	115
	1	Not Limited	Not Limited

For SI: 1 pound = 0.454 kg, 1 gallon = 3.785 L, 1 cubic foot = 0.02832 m^3.
a. Hazard categories are as specified in Section 5001.2.2.
b. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note c also applies, the increase for both notes shall be applied accumulatively.
c. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets in accordance with Section 5003.8. Where Note b also applies, the increase for both notes shall be applied accumulatively.
d. See Table 5003.8.3.2 for design and number of control areas.
e. Maximum allowable quantities for other hazardous material categories shall be in accordance with Section 5003.1.
f. Maximum allowable quantities shall be increased 100 percent in outdoor control areas.
g. Maximum allowable quantities shall be increased to 2,250 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
h. Maximum allowable quantities shall be increased to 4,500 pounds where individual packages are in the original sealed containers from the manufacturer or packager and do not exceed 10 pounds each.
i. Quantities are unlimited where protected by an automatic sprinkler system.
j. Quantities are unlimited in an outdoor control area.

6303.1.1.2 Class 3 liquid and solid oxidizers. Not more than ~~200~~ 220 pounds (~~91~~ 99 kg) of solid or ~~20~~ 22 gallons (~~76~~83 L) of liquid Class 3 oxidizer is allowed in storage and use where such materials

are necessary for maintenance purposes or operation of equipment. The oxidizers shall be stored in *approved* containers and in an *approved* manner.

Reason: Many 50 lb. containers of oxidizers have changed to 25 kg or 55 lb. containers. Four containers in use, which is a common condition, would equal 220 lb. This change will continue to allow 4 containers without a noticeable increase in the hazard. Also, when the maximum allowable quantity of oxidizers was established for mercantile occupancies, it was based on one pallet load of product. As explained above, the weight of some product has increased slightly, resulting in the total weight of a pallet load exceeding the 1150 lb MAQ. As a result, the top row of product has to be manually removed from the pallet before shipping to stay under the MAQ. This change resolves that problem by increasing the MAQ to accommodate current weights. Again, many 50 lb. containers have changed to a 25 kg or 55 lb. container. A normal pallet configuration of 8 55 lb. (25kg) pails per row, three high, would equal 1,320 lbs. The hazard is not noticeably increased and the original concept of retail MAQ quantity, of one pallet load, is maintained. Furthermore the change brings the IFC in line other NFPA codes that regulate oxidizers.

Cost Impact: Will not increase the cost of construction
The code change will reduce the costs of distribution by allowing full , instead of partial, pellet loads.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal reasonably increases the storage amounts by only 10%. This is a modest increase that reflects how this material is being packaged and stored.

Assembly Action: **None**

Final Action Results

F345-16 **AS**

Code Change No: F346-16

Original Proposal

Section: Table 5003.1.1; IBC [F] Table 307.1(1)

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

Revise as follows:

TABLE 5003.1.1 (IBC [F] 307.1(1)) (1)
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibers[g]	Loose Baled[o]	H-3	(100) (1,000)	NA	NA	(100) (1,000)	NA	NA	(20) (200)	NA
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d,e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
Consumer fireworks	1.4G	H-3	125 [e, l]	NA	NA	NA	NA	NA	NA	NA
Cryogenic Flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic Oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125 [d, e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e,g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable	Gaseous	H-2	NA	NA	1,000[d, e]	NA	NA	1,000[d,	NA	NA

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
gas	Liquefied			(150)[d, e]	NA		(150)[d, e]	[e] NA		
Flammable liquid[c]	IA IB and IC	H-2 or H-3	NA	30[d, e] 120[d, e]	NA	NA	30[d] 120[d]	NA	NA	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert Gas	Gaseous Liquefied	NA NA	NA NA	NA NA	NL NL	NA NA	NA NA	NL NL	NA NA	NA NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e, f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous Liquefied	H-3	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3 2 1	H-2 H-3 NA	5[d, e] 50[d, e] NL	(5)[d, e] (50)[d, e] NL	NA	5[d] 50[d] NL	(5)[d] (50)[d] NL	NA	1[d] 10[d] NL	(1)[d] (10)[d] NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.

e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d also

applies, the increase for both notes shall be applied accumulatively.
f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.
h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.
i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2.
j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.
l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.
m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.
n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.
o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
p. The following shall not be included in determining the maximum allowable quantities:
1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
3. Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.
4. Liquid fuels in piping systems and fixed appliances, regulated by the International Mechanical Code.
5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.
q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2.

Reason: The deletion of the reference to footnote "d" from the Explosives, Division 1.4G line is a cleanup following the successful action of F289-13. Without this deletion the effects of F289-13 will be negated since consumer fireworks are classified as 1.4G explosives and the continuance of footnote "d" would allow the100% increase when sprinklers are present. Please refer to the supporting statement of F289-13 for additional information.

(Supporting statement of F289-13)
Based on an October 2007 report entitled "Fire Safety in Consumer Fireworks Storage and Retail Facilities – Hazard Assessment", the NFPA Standards Council began a lengthy discussion on the amount of consumer fireworks that should be effectively permitted in retail establishments and some the built-in safety requirements that should be associated with that amount. To date the effective allowable amount in the NFPA standards has been 125 pounds net with an available increase to 250 pounds if the building is protected throughout with an approved automatic sprinkler system installed in accordance with NFPA 13. This same provision is mirrored in the IFC in all respects for the maximum allowable quantity of consumer fireworks, including the increase for sprinkler protection, and like the IFC, to allow a building to contain more than that, the NFPA standard would require additional construction requirements akin to those for a Group H-3 building.
Beginning with the October 2007 report, the NFPA Standards Council has since called into question the appropriateness and reasoning of an increase based on sprinkler protection in the absence of test data justifying the increase. Because of the lack of test data to determine at what level or quantity of consumer fireworks above 125 pounds net could or should have the benefit of sprinkler protection, the Standards Council has ordered the issuance of a Tentative Interim Amendment (TIA), in process at the time of this submission, eliminating the option of an increase for sprinkler protection until such time as acceptable test data is submitted to justify an increase and to what level of increase it could be. Therefore, due to the TIA, the maximum amount of consumer fireworks in the NFPA standard for retail establishments is limited to 125 pounds net. There will be no provision for increasing the amount due to sprinkler protection. In addition, with the TIA the maximum size of consumer firework storage buildings will be limited to 12,000ft² in area. Full background information may be found at the document information tab at www.nfpa.org/1124
For the same reasons, until such time as testing is completed, or if ever completed, this change is to delete the reference to footnote "d" that provided a 100% increase to the amount of consumer fireworks allowed if sprinkler protection is provided, when it has been revealed that the original increase was not based on a credible, verifiable series of tests to determine what the appropriate sprinkler design density should be for what may be typical of the quantities of consumer fireworks present in retail establishments and still not become a Group H-3 building.

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

Cost Impact: Will not increase the cost of construction
This will not increase the cost of construction it simply reduces the amount of 1.4G explosives permitted in a building equipped throughout with an automatic sprinkler system. This is consistent with the deletion of the same footnote for consumer fireworks that was removed for the 2015 IFC and IBC.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal was approved based upon the proponents reason statement. In addition, this revision is consistent with the removal of this footnote for fireworks 1.4G in past code change cycles.

Assembly Action: **None**

Final Action Results

F346-16	**AS**

Code Change No: F347-16

Original Proposal

Section: 202, 5003.1.1, 5601.1.3, 5601.8.1, 5604.3, 5604.5.2, 5609, 5609.1; IBC [F] Table 307.1(1)

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

Revise as follows:

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

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

High explosive. *Explosive material*, such as dynamite, which can be caused to detonate by means of a No. 8 test blasting cap where unconfined.

Low explosive. *Explosive material* that will burn or deflagrate when ignited. It is characterized by a rate of reaction that is less than the speed of sound. Examples of low *explosives* include, but are not limited to, black powder, safety fuse, igniters, igniter cord, fuse lighters, fireworks, ~~1.3G~~ and propellants, 1.3C.

Mass-detonating explosives. Division 1.1, 1.2 and 1.5 *explosives* alone or in combination, or loaded into various types of ammunition or containers, most of which can be expected to explode virtually instantaneously when a small portion is subjected to fire, severe concussion, impact, the impulse of an initiating agent or the effect of a considerable discharge of energy from without. Materials that react in this manner represent a mass explosion hazard. Such an *explosive* will normally cause severe structural damage to adjacent objects. Explosive propagation could occur immediately to other items of ammunition and *explosives* stored sufficiently close to and not adequately protected from the initially exploding pile with a time interval short enough so that two or more quantities must be considered as one for quantity-distance purposes.

UN/DOTn Class 1 explosives. The former classification system used by DOTn included the terms "high" and "low" *explosives* as defined herein. The following terms further define *explosives* under the current system applied by DOTn for all *explosive materials* defined as hazard Class 1 materials. Compatibility group letters are used in concert with the division to specify further limitations on each division noted (for example, the letter G identifies the material as a pyrotechnic substance or article containing a pyrotechnic substance and similar materials).

Division 1.1.*Explosives* that have a mass explosion hazard. A mass explosion is one which affects almost the entire load instantaneously.

Division 1.2. *Explosives* that have a projection hazard but not a mass explosion hazard.

Division 1.3. *Explosives* that have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard.

Division 1.4. *Explosives* that pose a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of almost the entire contents of the package.

Division 1.5. *Very insensitive explosives. This division is comprised of substances that have a mass explosion hazard but which are so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions of transport.*

Division 1.6. *Extremely insensitive articles which do not have a mass explosion hazard. This division is comprised of articles that contain only extremely insensitive detonating substances and which demonstrate a negligible probability of accidental initiation or propagation.*

FIREWORKS. Any composition or device for the purpose of producing a visible or an audible effect for entertainment purposes by combustion, *deflagration* or *detonation* that meets the definition of 1.4G fireworks or 1.3G fireworks.

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

Fireworks, 1.3G. Large fireworks devices, which are *explosive materials*, intended for use in fireworks displays and designed to produce audible or visible effects by combustion, *deflagration* or *detonation*. Such 1.3G fireworks include, but are not limited to, firecrackers containing more than 130 milligrams (2 grains) of explosive composition, aerial shells containing more than 40 grams of pyrotechnic composition and other display pieces which exceed the limits for classification as 1.4G fireworks. Such 1.3G fireworks are also described as Fireworks, UN 0335 by the DOTn.

TABLE 5003.1.1 [IBC[F]307.1(1)]
MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD[a, j, m, n, p]

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE[b]			USE-CLOSED SYSTEMS[b]			USE-OPEN SYSTEMS[b]	
			Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)	Gas (cubic feet at NTP)	Solid pounds (cubic feet)	Liquid gallons (pounds)
Combustible dust	NA	H-2	See Note q	NA	NA	See Note q	NA	NA	See Note q	NA
Combustible fibersg	Loose Baled[o]	H-3	(100) (1,000)	NA	NA	(100) (1,000)	NA	NA	(20) (200)	NA
Combustible liquid[c, i]	II	H-2 or H-3	NA	120[d,e]	NA	NA	120[d]	NA	NA	30[d]
	IIIA	H-2 or H-3		330[d, e]			330[d]			80[d]
	IIIB	NA		13,200[e, f]			13,200[f]			3,300[f]
~~Consumer fireworks~~	~~1.4G~~	~~H-3~~	~~125[e, l]~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~	~~NA~~
Cryogenic Flammable	NA	H-2	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic Oxidizing	NA	H-3	NA	45[d]	NA	NA	45[d]	NA	NA	10[d]
Explosives	Division 1.1	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]

	Division 1.2	H-1	1[e, g]	(1)[e, g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.3	H-1 or H-2	5[e, g]	(5)[e, g]		1[g]	(1)[g]		1[g]	(1)[g]
	Division 1.4	H-3	50[e, g]	(50)[e, g]		50[g]	(50)[g]		NA	NA
	Division 1.4G	H-3	125[d, e, l]	NA		NA	NA		NA	NA
	Division 1.5	H-1	1[e, g]	(1)[e,g]		0.25[g]	(0.25)[g]		0.25[g]	(0.25)[g]
	Division 1.6	H-1	1[e, g]	NA		NA	NA		NA	NA
Flammable gas	Gaseous Liquefied	H-2	NA	NA (150)[d, e]	1,000[d, e] NA	NA	NA (150)[d, e]	1,000[d, e] NA	NA	NA
Flammable liquid[c]	IA IB and IC	H-2 or H-3	NA	30[d, e] 120[d, e]	NA	NA	30[d] 120[d]	NA	NA	10[d] 30[d]
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120[d, e, h]	NA	NA	120[d, h]	NA	NA	30[d, h]
Flammable solid	NA	H-3	125[d, e]	NA	NA	125[d]	NA	NA	25[d]	NA
Inert Gas	Gaseous Liquefied	NA NA	NA NA	NA NA	NL NL	NA NA	NA NA	NL NL	NA NA	NA NA
Organic peroxide	UD	H-1	1[e, g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	I	H-2	5[d, e]	(5)[d, e]		1[d]	(1)[d]		1[d]	(1)[d]
	II	H-3	50[d, e]	(50)[d, e]		50[d]	(50)[d]		10[d]	(10)[d]
	III	H-3	125[d, e]	(125)[d, e]		125[d]	(125)[d]		25[d]	(25)[d]
	IV	NA	NL	NL		NL	NL		NL	NL
	V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1[g]	(1)[e, g]	NA	0.25[g]	(0.25)[g]	NA	0.25[g]	(0.25)[g]
	3[k]	H-2 or H-3	10[d, e]	(10)[d, e]		2[d]	(2)[d]		2[d]	(2)[d]
	2	H-3	250[d, e]	(250)[d, e]		250[d]	(250)[d]		50[d]	(50)[d]
	1	NA	4,000[e, f]	(4,000)[e,f]		4,000[f]	(4,000)[f]		1,000[f]	(1,000)[f]
Oxidizing gas	Gaseous Liquefied	H-3	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA (150)[d, e]	1,500[d, e] NA	NA	NA
Pyrophoric	NA	H-2	4[e, g]	(4)[e, g]	50[e, g]	1[g]	(1)[g]	10[e, g]	0	0
Unstable (reactive)	4	H-1	1[e, g]	(1)[e, g]	10[e, g]	0.25[g]	(0.25)[g]	2[e, g]	0.25[g]	(0.25)[g]
	3	H-1 or H-2	5[d, e]	(5)[d, e]	50[d, e]	1[d]	(1)[d]	10[d, e]	1[d]	(1)[d]
	2	H-3	50[d, e]	(50)[d, e]	750[d, e]	50[d]	(50)[d]	750[d, e]	10[d]	(10)[d]
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL
Water reactive	3 2 1	H-2 H-3 NA	5[d, e] 50[d, e] NL	(5)[d, e] (50)[d, e] NL	NA	5[d] 50[d] NL	(5)[d] (50)[d] NL	NA	1[d] 10[d] NL	(1)[d] (10)[d] NL

For SI: 1 cubic foot = 0.02832 m^3, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

a. For use of control areas, see Section 5003.8.3.

b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.

c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.

d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic

sprinkler system in accordance with Section 903.3.1.1. Where Note e also applies, the increase for both notes shall be applied accumulatively.
e. Maximum allowable quantities shall be increased 100 percent where stored in approved storage cabinets, day boxes, gas cabinets, gas rooms, exhausted enclosures or in listed safety cans in accordance with Section 5003.9.10. Where Note d also applies, the increase for both notes shall be applied accumulatively.
f. Quantities shall not be limited in a building equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1.
g. Allowed only in buildings equipped throughout with an approved automatic sprinkler system.
h. Containing not more than the maximum allowable quantity per control area of Class IA, Class IB or Class IC flammable liquids.
i. The maximum allowable quantity shall not apply to fuel oil storage complying with Section 603.3.2.
j. Quantities in parenthesis indicate quantity units in parenthesis at the head of each column.
k. A maximum quantity of 200 pounds of solid or 20 gallons of liquid Class 3 oxidizers is allowed where such materials are necessary for maintenance purposes, operation or sanitation of equipment where the storage containers and the manner of storage are approved.
l. Net weight of pyrotechnic composition of the fireworks. Where the net weight of the pyrotechnic composition of the fireworks is not known, 25 percent of the gross weight of the fireworks including packaging shall be used.
m. For gallons of liquids, divide the amount in pounds by 10 in accordance with Section 5003.1.2.
n. For storage and display quantities in Group M and storage quantities in Group S occupancies complying with Section 5003.11, see Table 5003.11.1.
o. Densely-packed baled cotton that complies with the packing requirements of ISO 8115 shall not be included in this material class.
p. The following shall not be included in determining the maximum allowable quantities:
1. Liquid or gaseous fuel in fuel tanks on vehicles.
2. Liquid or gaseous fuel in fuel tanks on motorized equipment operated in accordance with this code.
3. Gaseous fuels in piping systems and fixed appliances regulated by the International Fuel Gas Code.
4. Liquid fuels in piping systems and fixed appliances, regulated by the International Mechanical Code.
5. Alcohol-based hand rubs classified as Class I or II liquids in dispensers that are installed in accordance with Sections 5705.5 and 5705.5.1. The location of the alcohol-based hand rub (ABHR) dispensers shall be provided in the construction documents.
q. Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on information prepared in accordance with Section 104.7.2.

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 such fireworks and facilities comply with NFPA 1124, CPSC 16 CFR Parts 1500 and 1507, and DOTn 49 CFR Parts 100–185, as applicable for consumer fireworks.

TABLE 5601.8.1 (3)
APPLICATION OF SEPARATION DISTANCE (Q-D) TABLES—DIVISION 1.4 EXPLOSIVES[a, b, c, d]

ITEM	MAGAZINE	Q-D	OPERATING BUILDING	Q-D	INHABITED BUILDING	Q-D	PUBLIC TRAFFIC ROUTE	Q-D
Magazine	Table 5604.5.2(3)	IMD	Table 5604.5.2(3)	ILD or IPD	Table 5604.5.2(3)	IBD	Table 5604.5.2(3)	PTR
Operating building	Table 5604.5.2(3)	ILD or IPD	Table 5604.5.2(3)	ILD or IPD	Table 5604.5.2(3)	IBD	Table 5604.5.2(3)	PTR
Inhabited building	Table 5604.5.2(3)	IBD	Table 5604.5.2(3)	IBD	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Public traffic route	Table 5604.5.2(3)	PTR	Table 5604.5.2(3)	PTR	Not Applicable	Not Applicable	Not Applicable	Not Applicable

For SI:1 foot = 304.8 mm.
a. The minimum separation distance (D_o) shall be not less than 50 feet.
b. Linear interpolation between tabular values in the referenced Q-D table shall not be allowed.
c. For definitions of Quantity-Distance abbreviations IBD, ILD, IMD, IPD and PTR, see Chapter 2.
~~d. This table shall not apply to consumer fireworks, 1.4G.~~

TABLE 5604.3
STORAGE AMOUNTS AND MAGAZINE REQUIREMENTS FOR EXPLOSIVES, EXPLOSIVE MATERIALS AND FIREWORKS, 1.3G MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA

NEW UN/ DOTn DIVISION	OLD DOTn CLASS	ATF/OSHA CLASS	INDOOR[a](pounds)				OUTDOOR (pounds)	MAGAZINE TYPE REQUIRED				
			Unprotected	Cabinet	Sprinklers	Sprinklers & cabinet		1	2	3	4	5
1.1[b]	A	High	0	0	1	2	1	X	X	X	—	—
1.2	A	High	0	0	1	2	1	X	X	X	—	—
1.2	B	Low	0	0	1	1	1	X	X	X	X	—
1.3	B	Low	0	0	5	10	1	X	X	X	X	—
1.4[c]	B	Low	0	0	50	100	1	X	X	X	X	—
1.5	C	Low	0	0	1	2	1	X	X	X	X	—
1.5	Blasting Agent	Blasting Agent	0	0	1	2	1	X	X	X	X	X
1.6	Not Applicable	Not Applicable	0	0	1	2	1	X	X	X	X	X

For SI:1 pound = 0.454 kg, 1 pound per gallon = 0.12 kg per liter, 1 ounce = 28.35 g.
a. A factor of 10 pounds per gallon shall be used for converting pounds (solid) to gallons (liquid) in accordance with Section 5003.1.2.
b. Black powder shall be stored in a Type 1, 2, 3 or 4 magazine as provided for in Section 5604.3.1.
~~c. This table shall not apply to consumer fireworks, 1.4G~~

TABLE 5604.5.2 (3)
TABLE OF DISTANCES (Q-D) FOR BUILDINGS AND MAGAZINES CONTAINING EXPLOSIVES—DIVISION 1.4[c]

QUANTITY OF DIVISION 1.4 EXPLOSIVES (NET EXPLOSIVES WEIGHT)		DISTANCES IN FEET			
Pounds over	Pounds not over	Inhabited Building Distance (IBD)	Distance to Public Traffic Route (PTR)	Intermagazine Distance[a, b](IMD)	Intraline Distance (ILD) or Intraplant Distance[a](IPD)
50	Not Limited	100	100	50	50

For SI: 1 foot = 304.8 mm, 1 pound = 0.454 kg.
a. A separation distance of 100 feet is required for buildings of other than Type I or Type II construction as defined in the *International Building Code*.
b. For earth-covered magazines, specific separation is not required.
1. Earth cover material used for magazines shall be relatively cohesive. Solid or wet clay and similar types of soil are too cohesive and shall not be used. Soil shall be free from unsanitary organic matter, trash, debris and stones heavier than 10 pounds or larger than 6 inches in diameter. Compaction and surface preparation shall be provided, as necessary, to maintain structural integrity and avoid erosion. Where cohesive material cannot be used, as in sandy soil, the earth cover over magazines shall be finished with a suitable material to ensure structural integrity.
2. The earth fill or earth cover between earth-covered magazines shall be either solid or sloped, in accordance with the requirements of other construction features, but not less than 2 feet of earth cover shall be maintained over the top of each magazines. To reduce erosion and facilitate maintenance operations, the cover shall have a slope of 2 horizontal to 1 vertical.
c. Restricted to articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpacked articles used in process operations that do not propagate a detonation or deflagration between articles. ~~This table shall not apply to consumer fireworks, 1.4G.~~

SECTION 5609
TEMPORARY STORAGE OF ~~CONSUMER~~ FIREWORKS 1.4G (CONSUMER FIREWORKS)

5609.1 General. Where the display or temporary storage of ~~consumer~~ 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.

Reason: Summary of change:

1. Reverse action of Code Change B3-97 and F18-98 that were based on absent or defective reasoning.

2. Reverse subsequent action of Code Change F265-07/08, F266-07/08 and F267-07/08 based on the defective decision of Code B3-97 and F18-98.

What is the "purpose" of stating fireworks are not explosive? What's the reason? How do you determine or apply the purpose when the purpose is unknown? Therefore, this coordinated set of changes is to reverse changes made that were based on absent or defective reasoning. The history is as follows.

The IFC definition language noting that consumer fireworks should not be considered "explosive materials for the purpose of this code" originated through BOCA code change F97-99 which was built upon BOCA code change B3-97 of the previous cycle. The proponent at the time stated the change was to "revise the definitions for consumer fireworks and display to be more closely aligned with the definitions contained in the 1997 IFCI Uniform Fire Code including 1999 Accumulative Supplement and the 1999 BOCA National Fire Prevention Code." What was lacking in those originating changes was the information to support and describe what the "purpose" was supposed to be and is to be continued.

B3-97

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

B18-98

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

(At the time of this submission copies of the UFC code changes referenced above had not been located but it is suspected the supporting statements closely resembled those submitted to BOCA.)

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

Comparative research in the more current versions of the documents referenced in the definitions of explosives and fireworks reveal the following:

- DOTn 49 CFR, Parts 100-177, a 923 page document about the manner in which all HazMat is to be transported on the public highway, the word "firework" appears 32 times. The word "explosive" appears 1,150 The words "firework" and "explosives" do not appear or are linked together in the same sentence or any paragraphs for the affect of saying consumer fireworks are **not** explosive.
- DOTn 49 CFR, Part 178, a 251 page document on the "Specifications for Packagings" when transporting, the word "firework" appears zero (0) times and the word "explosive" appears 3 times. Therefore at no time do they appear or are linked together in the same sentence or any paragraph for the affect of saying consumer fireworks are **not**
- CPCS 16 CFR, Part 1500, a 110 page document on the "Hazardous Substances and Articles; Administration and Enforcement Regulations" of the "Federal Hazardous Substances Act Regulations", the word "firework" appears 26 times. The word "explosive" appears 19 times. The words "firework" and "explosives" do not appear or are linked together in the same sentence or any paragraphs for the affect of saying consumer fireworks are **not**
- CPCS 16 CFR, Part 15070, "Firework Devices" the word "firework" appears 9 times. The word "explosive" appears zero (0) times. Therefore at no time do they appear or are linked together in the same sentence or any paragraph.

The reinforcing point is, again, even Federal regulations do not make a statement that consumer fireworks are not explosive for some unknown purpose. The same is still true for ATF, IME, APA Standard 87-1, and NFPA 1, 495, 1123 and 1124.
It was the accumulative results of B3-97 and F18-98 that lent themselves to being referenced in the supporting statement for IFC code change F97-99 to support or justify "align(ment)".

That portion of the proposed definition change to Fireworks, 1.4G to include "deflagration" is a resurrection of a previously used descriptor and is to more accurately reflect the functioning of some consumer fireworks. While a sparkler or fountain in a consumer firework may operate through combustion, simple combustion does not necessarily mean enough force will be produced quickly enough for the device to function in a desired manner. If the pyrotechnic material does not deflagrate, the consumer grade flaming balls of roman candles may not launch; and aerial devices may not have enough expelling force to obtain the needed altitude. Firecrackers have to, at minimum, deflagrate. Rockets have to deflagrate. Aerial devices have to deflagrate. Anything with a report must, at minimum, deflagrate.

If it is agreed through the coming code cycle that consumer fireworks are indeed "explosive" for the purpose of the code, then code changes F265-07/08, F266-07/08 and F267-07/08 must also be reversed because those changes are built upon the definition of fireworks.

The change to Table 5603.1.1(1) is a change to reflect that consumer fireworks are indeed properly classified as an Explosive 1.4G and it's not necessary to have a separate line with identical threshold values, including all footnotes, in order to determine at what point a building would be or should be classified as a Group H-3. It's redundancy within the same table. In reality, at least at the model code level, other than the deletion of language saying consumer fireworks are not explosive, the net effect of the change to Table 5603.1.1(1) will be zero to what is taking place in the world of consumer fireworks manufacturing, storage, sale and use.

The insertion of the words "as applicable" in Section 5601.1.3, Exception 4 is editorial and is to reflect that not all things in the reference material may be applicable.

It should also be noted that this is essentially a resubmission of code change F186-09/10.

Attachments: BOCA Code Changes B3-97, F18-98; IFC Code Change F96-99; Excerpts from DOTn and ATF, proposed changes and final actions on F265-07/08, F266-07/08 and F267-07/08; Extracts from 49 CFR, Parts 100-177; Extracts from ATF Regulations.

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

Cost Impact: Will not increase the cost of construction
This now simply clarifies that Class 1.4G fireworks are considered as explosives and should be addressed this way.A separate line item will no longer be included but it will still be considered as Group H-3 if the MAQ is exceeded.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee agreed that fireworks 1.4G should be treated as explosives and should be revised throughout the code to reflect this intent.

Assembly Action: **None**

Final Action Results

F347-16 **AS**

Code Change No: F352-16

Original Proposal

Section: Table 5003.8.2; IBC Table [F] 415.6.2

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

Revise as follows:

TABLE 5003.8.2
DETACHED BUILDING REQUIRED

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

For SI: 1 pound = 0.454 kg, 1 cubic foot = 0.02832 m^3, 1 ton = 2000 lbs. = 907.2 kg.

a. For materials that are detonable, the distance to other buildings or lot lines shall be ~~as specified~~ in accordance with Section 415.6 of the International Building Code and Chapter 56 based on the trinitrotoluene (TNT) equivalence of the material, whichever is greater. ~~For materials classified as explosives, the required separation distances shall be as specified in Chapter 56.~~

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 5003.1.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives regulations, or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, providing the net explosive weight of individual articles does not exceed 1 pound.

TABLE [F] 415.6.2
DETACHED BUILDING REQUIRED

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

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

a. For materials that are detonable, the distance to other buildings or lot lines shall be in accordance with Section 415.6 of this code and Chapter 56 of the *International Fire Code* based on trinitrotoluene (TNT) equivalence of the material, whichever is greater. ~~For materials classified as explosives, see Chapter 56 of the International Fire Code.~~

b. "Maximum Allowable Quantity" means the maximum allowable quantity per control area set forth in Table 307.1(1).

c. Limited to Division 1.4 materials and articles, including articles packaged for shipment, that are not regulated as an explosive under Bureau of Alcohol, Tobacco, Firearms and Explosives (BATF) regulations or unpackaged articles used in process operations that do not propagate a detonation or deflagration between articles, provided the net explosive weight of individual articles does not exceed 1 pound.

Reason: There is a disconnect between the IFC and IBC with regard to the footnotes in these two tables. The tables are identical, however the footnotes are not.

With regard to buildings containing materials which are detonable, Footnote a in the IFC refers to the IBC for separation distances while Footnote a in the IBC refers back to Chapter 56 in the IFC. This reference in the IFC should simply send the code user to IFC Chapter 56. Chapter 56 contains the criteria for building separations based on the quantity of explosive material in the building.

The revision in Footnote c is simply an editorial revision to provide consistency between the two codes.

This proposal is submitted by the ICC Fire Code Action Committee (FCAC). The FCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance assigned International Codes with regard to fire safety and hazardous materials in new and existing buildings and facilities and the protection of life and property in wildland urban interface areas. In 2014

and 2015 the Fire-CAC has held 5 open meetings. In addition, there were numerous conference calls, Regional Work Group and Task Group meetings for the current code development cycle, which included members of the committees as well as any interested parties, to discuss and debate the proposed changes. Related documentation and reports are posted on the FCAC website at: FCAC

Cost Impact: Will not increase the cost of construction
This proposal provides correlation between the IBC and IFC.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal provides the necessary clarification between the tables within the IFC and IBC. The current format of the table sent code users in a loop.

Assembly Action: **None**

Final Action Results

F352-16 **AS**

Code Change No: F354-16

Original Proposal

Section: Table 5003.8.3.2,; IBC [F] Table 414.2.2

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

Revise as follows:

TABLE 5003.8.3.2 ([F] 414.2.2)
DESIGN AND NUMBER OF CONTROL AREAS

~~FLOOR LEVEL~~ STORY		PERCENTAGE OF THE MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA[a]	NUMBER OF CONTROL AREAS PER ~~FLOOR~~STORY	FIRE-RESISTANCE RATING FOR FIRE BARRIERS IN HOURS[b]
Above grade plane	Higher than 9	5	1	2
	7-9	5	2	2
	6	12.5	2	2
	5	12.5	2	2
	4	12.5	2	2
	3	50	2	1
	2	75	3	1
	1	100	4	1
Below grade plane	1	75	3	1
	2	50	2	1
	Lower than 2	Not Allowed	Not Allowed	Not Allowed

a. Percentages shall be of the maximum allowable quantity per control area shown in Tables 5003.1.1(1) and 5003.1.1(2), with all increases allowed in the footnotes to those tables.
b. Separation shall include fire barriers and horizontal assemblies as necessary to provide separation from other portions of the building.

Reason: The IBC and IFC limit the number of control areas within a building on a per story basis due to the difficulties of fire fighting as the height of a building increases. The codes trigger requirements based on the number of stories above or below grade plane and the location above and below the level of exit discharge which is a defined term defined as a story. It is therefore an anomaly that the term level and floor are used in lieu of the defined term story.

This code change revises the undefined term level to story. The IBC/IFC refer to stories which include basements which are stories below grade plane. Additionally mezzanines are floor levels within stories. As a result a control area in a basement is in a story below grade plane and a control area on the second story is on the second story above grade plane.
This proposal eliminates the possible confusion from the the term level or floor, that can include mezzanines.

Cost Impact: Will not increase the cost of construction
This is an editorial code change. Should not result in an increase in the cost of construction since many code users interpret the codes as the proposed revisions state.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The committee felt that the use of the term "story" was more appropriate than "floor." The term is consistent with the control area concept in the IBC and IFC.

Assembly Action: **None**

Final Action Results

F354-16 **AS**

Code Change No: F355-16

Original Proposal

Section: 5003.8.3.4; IBC [F] 414.2.4

Proponent: Dennis Richardson, American Wood Council, representing American Wood Council (drichardson@awc.org)

Revise as follows:

5003.8.3.4 (IBC [F]414.2.4) Fire-resistance-rating requirements. The required *fire-resistance rating* for *fire barriers* shall be in accordance with Table 5003.8.3.2. The floor assembly of the *control area* and the construction supporting the floor of the *control area* shall have a *fire-resistance rating* of not less than 2 hours.

Exception: The floor assembly of the *control area* and the construction supporting the floor of the *control area* is allowed to be 1-hour *fire-resistance* rated in buildings of Type IIA, IIIA, IV and VA construction, provided that both of the following conditions exist:

1. The building is equipped throughout with an *automatic sprinkler system* in accordance with 2.
2. The building is three stories or less above grade plane.

Reason: The interior construction of Types IIIA and VA construction, can be built of the exact same material as type IV construction so long that it is calculated or tested to be one hour fire resistance rated. Type IV construction is preferable for hazardous occupancies to Type IIIA or Type VA construction from an allowable area standpoint in the current code due to performance. Since Type IIIA and Type VA can be built out of exactly the same material as long as it is one hour, and since the control area is separated from the balance of the building by one hour construction, there is no reason to exclude type IV from this exception from two hour fire resistance rating of the floor assembly and supporting construction for the control area in buildings three stories or less and fully sprinklered with a NFPA 13 sprinkler system.

Cost Impact: Will not increase the cost of construction
This code proposal provides more options to the existing exception and will not increase cost.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: The addition of Type IV construction to the exception to the rating of floors for control areas was felt to be a reasonable approach and would be consistent with the protection provided for other construction types.

Assembly Action: **None**

Final Action Results

F355-16	**AS**

Code Change No: F356-16

Original Proposal

Section: 5003.8.3.5 (New), 5003.8.3.5, 5003.8.3.5.2 (New), 5003.8.3.5.3 (New), IBC [F] 414.2.5 (New), [F] 414.2.5, [F]414.2.5.2 (New), [F] 414.2.5.3 (New)

Proponent: Homer Maiel, PE, representing ICC Tri-Chapter (Peninsula, East Bay, Monterey Bay) (hmaiel@gmail.com)

Add new text as follows:

5003.8.3.5 Hazardous materials in Group M display and storage areas an in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 5003.8.3.5.1 through 5003.8.3.5.3.

Revise as follows:

~~**5003.8.3.5**~~ **5003.8.3.5.1 Non flammable solids and non flammable and noncombustible liquids. ~~Hazardous material in Group M display and storage areas and in Group S storage areas.~~** The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials allowed within a single *control area* of a Group M display and storage area or a Group S storage area is allowed to exceed the *maximum allowable quantities per control area* specified in Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with Section 5003.11.

Add new text as follows:

5003.8.3.5.2 Flammable and combustible Liquids. In Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per *control area* as indicated in Table 5704.3.4.1, provided that the materials are displayed and stored in accordance with Chapter 57.

5003.8.3.5.3 Aerosols. The maximum quantity of aerosol products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with Chapter 51.

2015 International Building Code

Add new text as follows:

[F] 414.2.5 Hazardous material in Group M display and storage areas in Group S storage areas. Hazardous materials located in Group M and Group S occupancies shall be in accordance with Sections 414.2.5.1 through 414.2.5.3.

Revise as follows:

[F] ~~414.2.5~~414.2.5.1 ~~Hazardous material in Group M display~~ Non flammable solid and ~~storage areas~~ non flammable and ~~in Group S storage areas.~~ non combustible liquids. The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials permitted within a single *control area* of a Group M display and storage area, a Group S storage area or an outdoor *control area* is permitted to exceed the maximum allowable quantities per *control area* specified in Tables

307.1(1) and 307.1(2) without classifying the building or use as a Group H occupancy, provided that the materials are displayed and stored in accordance with the *International Fire Code* and quantities do not exceed the maximum allowable specified in Table 414.2.5(1).

Add new text as follows:

[F]414.2.5.2 Hazardous material in Group M wholesale and retail sales uses. In Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area as indicated in Table 414.2.5(2), provided that the materials are displayed and stored in accordance with the International Fire Code.

[F] 414.2.5.3 Aerosols. The maximum quantity of aerosol products in Group M occupancy retail display areas, storage areas adjacent to retail display areas and retail storage areas shall be in accordance with the *International Fire Code*.

Reason: The intent of this proposal is to break up this one section into three to address each subject to differentiate between the uses. Additionally to keep the codes consistent the similar section in IFC 5003 is also being addressed. These sections are different therefore must be shown independently. There are no technical changes.

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

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal provides a much clearer presentation of the requirements then currently structured. This includes making the provisions more consistent between the IBC and IFC.

Assembly Action: **None**

Final Action Results

F356-16 **AS**

Code Change No: F363-16

Original Proposal

Section: 202, 907.2.16 (IBC [F] 907.2.16), 5102.1, 5104.1.1, 5104.3, 5104.3.1, 5104.3.2, 5106.2.2, 5106.3, 5106.3.2, 5106.3.3, 5106.4, 5106.5, 5106.5.1, 5106.5.2, 5106.5.6, 5106.5.7, IBC [F] 307.1.1, [F] 307.2, 311.2, [F] 414.1.2.1

Proponent: Patrick McLaughlin, representing Consumer Specialty Products Association (pmclaugma@aol.com)

Revise as follows:

AEROSOL CONTAINER. A metal can or plastic container, up to a maximum size of 33.8 fl.oz. (1000 ml) or a glass ~~or plastic~~ bottle, up to a maximum size of 4 fl.oz. (118 ml), that is designed and intended to dispense an aerosol.

AEROSOL. PRODUCT A ~~product~~ combination of a container, a propellant and a material that is dispensed ~~from an aerosol container by a propellant~~.

Aerosol products shall be classified by means of the calculation of their chemical heats of combustion and shall be designated Level 1, Level 2 or Level 3.

Level 1 aerosol products. Those with a total chemical heat of combustion that is less than or equal to 8,600 British thermal units per pound (Btu/lb) (20 kJ/g).

Level 2 aerosol products. Those with a total chemical heat of combustion that is greater than 8,600 Btu/lb (20 kJ/g), but less than or equal to 13,000 Btu/lb (30 kJ/g).

Level 3 aerosol products. Those with a total chemical heat of combustion that is greater than 13,000 Btu/lb (30 kJ/g).

AEROSOL PRODUCT WAREHOUSE. *No change to text.*

5102.1 Definitions. The following terms are defined in Chapter 2:

AEROSOL PRODUCT.
Level 1 aerosol products.
Level 2 aerosol products.
Level 3 aerosol products.
AEROSOL CONTAINER.
AEROSOL PRODUCT WAREHOUSE.
PROPELLANT.
RETAIL DISPLAY AREA.

5104.1.1 Plastic ~~containers~~ Aerosol 1 Products. Aerosol products in plastic containers larger than 4 fluid ounces (118 ml), but not to exceed 33.8 fluid ounces (1000 ml), shall be allowed only where in accordance with this section. The commodity classification shall be Class III commodities, as defined in NFPA 13 where any of the following conditions are met:

1. Base product has no fire point where tested in accordance with ASTM D 92, and nonflammable propellant.

2. Base product has no sustained combustion as tested in accordance with Appendix H, "Method of Testing for Sustained Combustibility," in DOTn 49 CFR Part 173, and nonflammable propellant.
3. Base product contains up to 20 percent by volume (15.8 percent by weight) of ethanol and/or isopropyl alcohol in an aqueous mix, and nonflammable propellant.
4. Base product contains 4 percent by weight or less of an emulsified flammable liquefied gas propellant within an aqueous base. The propellant shall remain emulsified for the life of the product. Where such propellant is not permanently emulsified, the propellant shall be nonflammable.

5104.3 Storage in general purpose warehouses. Aerosol product storage in general purpose warehouses utilized only for warehousing-type operations involving mixed commodities shall comply with Section 5104.3.1 or 5104.3.2.

5104.3.1 Nonsegregated storage. Storage consisting of solid pile, palletized or rack storage of Level 2 and 3 aerosol products not segregated into areas utilized exclusively for the storage of aerosols products shall comply with Table 5104.3.1.

5104.3.2 Segregated storage. Storage of Level 2 and 3 aerosol products segregated into areas utilized exclusively for the storage of aerosols products shall comply with Table 5104.3.2 and Sections 5104.3.2.1 and 5104.3.2.2.

5106.2.2 Display of ~~containers~~ aerosol products. Level 2 and 3 aerosol ~~containers~~ products shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol product array to the top of the aerosol product array unless the ~~containers~~ aerosol products are placed on fixed shelving or otherwise secured in an *approved* manner. Where storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol ~~containers~~ products shall not exceed 8 feet (2438 mm).

5106.3 Aerosol product display and normal merchandising exceeding 8 feet (2438 mm) high. Aerosol product display and merchandising exceeding 8 feet in height shall be in accordance with Sections 5106.3.1 through 5106.3.3.

5106.3.2 Automatic sprinkler protection. Aerosol product display and merchandising areas shall be protected by an *automatic sprinkler system* based on the requirements set forth in Tables ~~6.3.2.7(a~~6.4.2.7(a) through ~~6.3.2.7(l~~6.4.2.7(l) of NFPA 30B and the following:

1. Protection shall be based on the highest level of aerosol product in the array and the packaging method of the storage located more than 6 feet (1829 mm) above the finished floor.
2. Where using the cartoned aerosol product tables of NFPA 30B, uncartoned or display-cut Level 2 and 3 ~~aerosols~~ aerosol products shall be permitted not more than 6 feet (1829 mm) above the finished floor.
3. The design area for Level 2 and 3 ~~aerosols~~ aerosol products shall extend not less than 20 feet (6096 mm) beyond the Level 2 and 3 aerosol product display and merchandising areas.
4. Where ordinary and high-temperature ceiling sprinkler systems are adjacent to each other, noncombustible draft curtains shall be installed at the interface.

5106.3.3 Separation of Level 2 and 3 aerosol product areas. Separation of Level 2 and 3 aerosol product areas shall comply with the following:

1. Level 2 and 3 aerosol product display and merchandising areas shall be separated from each other by not less than 25 feet (7620 mm). See Table 5106.2.1.
2. Level 2 and 3 aerosol Product display and merchandising areas shall be separated from flammable and *combustible liquids* storage and display areas by one or a combination of the following:
   2.1. Segregating areas from each other by horizontal distance of not less than 25 feet (7620 mm).
   2.2. Isolating areas from each other by a noncombustible partition extending not less than 18 inches (457 mm) above the merchandise.

2.3. In accordance with Section 5106.5.

3. Where Item 2.2 is used to separate Level 2 or 3 ~~aerosols~~ aerosol products from flammable or *combustible liquids*, and the aerosol products are located within 25 feet (7620 mm) of flammable or *combustible liquids*, the area below the noncombustible partition shall be liquid tight at the floor to prevent spilled liquids from flowing beneath the aerosol products.
4.

TABLE 5106.4
MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND 3 ~~AEROSOLS~~ AEROSOL PRODUCTS

MAXIMUM NET WEIGHT PER FLOOR (pounds)			
Floor	Unseparated[a,b]	Separated	
		Storage Cabinets[b]	1-hour Occupancy Separation
Basement	Not Allowed	Not Allowed	Not Allowed
Ground	2,500	5,000	In accordance with Sections ~~6.3.4.3~~6.4.4.3 and ~~6.3.4.4~~ 6.4.4.4 of NFPA 30B
Upper	500	1,000	In accordance with Sections ~~6.3.4.3~~6.4.4.3 and ~~6.3.4.4~~6.4.4.4 of NFPA 30B

For SI: 1 pound = 0.454 kg, 1 square foot = 0.0929 m^2 .
a. The aggregate quantity in storage and retail display shall not exceed the quantity limits for retail display.
b. In any 50,000-square-foot area.

5106.5 Special protection design for Level 2 and 3 ~~aerosols~~ aerosol products adjacent to flammable and combustible liquids in double-row racks. The display and merchandising of Level 2 and 3 ~~aerosols~~ aerosol products adjacent to flammable and *combustible liquids* in double-row racks shall be in accordance with Sections 5106.5.1 through 5106.5.8 or Section 5106.3.3.

5106.5.1 Fire protection. Fire protection for the display and merchandising of Level 2 and 3 ~~aerosols~~ aerosol products in double-row racks shall be in accordance with Table ~~7.4.1~~ 7.5.1 and Figure ~~7.4.1~~ 7.5.1 of NFPA 30B.

5106.5.2 Cartoned aerosol products. Level 2 and 3 ~~aerosols~~ aerosol products displayed or merchandised more than 8 feet (2438 mm) above the finished floor shall be in cartons.

5106.5.6 Horizontal barriers. Horizontal barriers constructed of minimum $^3/_8$-inch-thick (10 mm) plywood or minimum 0.034-inch (0.086 mm) (No. 22 gage) sheet metal shall be provided and located in accordance with Table ~~7.4.1~~ 7.5.1 and Figure ~~7.4.1~~ 7.5.1 of NFPA 30B where in-rack sprinklers are installed.

5106.5.7 Class I, II, III, IV and plastic commodities. Class I, II, III, IV and plastic commodities located adjacent to Level 2 and 3 ~~aerosols~~ aerosol products shall be protected in accordance with NFPA 13.

907.2.16 Aerosol storage uses. Aerosol product storage rooms and general-purpose warehouses containing ~~aerosols~~ aerosol products shall be provided with an *approved* manual fire alarm system where required by this code.

2015 International Building Code

Revise as follows:

[F] 307.1.1 Uses other than Group H. An occupancy that stores, uses or handles hazardous materials as described in one or more of the following items shall not be classified as Group H, but shall be classified as the occupancy that it most nearly resembles.

1. Buildings and structures occupied for the application of flammable finishes, provided that such buildings or areas conform to the requirements of Section 416 and the *International Fire Code*.
2. Wholesale and retail sales and storage of flammable and combustible liquids in mercantile occupancies conforming to the *International Fire Code*.
3. Closed piping system containing flammable or combustible liquids or gases utilized for the operation of machinery or equipment.
4. Cleaning establishments that utilize combustible liquid solvents having a flash point of 140°F (60°C) or higher in closed systems employing equipment *listed* by an *approved* testing agency, provided that this occupancy is separated from all other areas of the building by 1-hour *fire barriers* constructed in accordance with Section 707 or 1hour *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 batteries utilized for facility emergency power, uninterruptable power supply or telecommunication facilities, provided that the batteries are provided with safety venting caps and *ventilation* is provided in accordance with the *International Mechanical Code.*
10. Corrosive personal or household products in their original packaging used in retail display.
11. Commonly used corrosive building materials.
12. Buildings and structures occupied for aerosol 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*.

[F] 307.2 Definitions. The following terms are defined in Chapter 2:

AEROSOL PRODUCT
Level 1 aerosol products.
Level 2 aerosol products.
Level 3 aerosol products.
AEROSOL CONTAINER.
BALED COTTON.
BALED COTTON, DENSELY PACKED.
BARRICADE.
Artificial barricade.
Natural barricade.
BOILING POINT.
CLOSED SYSTEM.
COMBUSTIBLE DUST.
COMBUSTIBLE FIBERS.
COMBUSTIBLE LIQUID.
Class II.
Class IIIA.
Class IIIB.
COMPRESSED GAS.
CONTROL AREA.
CORROSIVE.
CRYOGENIC FLUID.
DAY BOX.
DEFLAGRATION.
DETONATION.

DISPENSING.
EXPLOSION.
EXPLOSIVE.
High explosive.
Low explosive.
Mass-detonating explosives.
UN/DOTn Class 1 explosives.
Division 1.1.
Division 1.2.
Division 1.3.
Division 1.4.
Division 1.5.
Division 1.6.
FIREWORKS.
Fireworks, 1.3G.
Fireworks, 1.4G.
FLAMMABLE GAS.
FLAMMABLE LIQUEFIED GAS.
FLAMMABLE LIQUID.
Class IA.
Class IB.
Class IC.
FLAMMABLE MATERIAL.
FLAMMABLE SOLID.
FLASH POINT.
HANDLING.
HAZARDOUS MATERIALS.
HEALTH HAZARD.
HIGHLY TOXIC.
INCOMPATIBLE MATERIALS.
INERT GAS.
OPEN SYSTEM.
OPERATING BUILDING.
ORGANIC PEROXIDE.
Class I.
Class II.
Class III.
Class IV.
Class V.
Unclassified detonable.
OXIDIZER.
Class 4.
Class 3.
Class 2.
Class 1.
OXIDIZING GAS.
PHYSICAL HAZARD.
PYROPHORIC.
PYROTECHNIC COMPOSITION.
TOXIC.
UNSTABLE (REACTIVE) MATERIAL.
Class 4.
Class 3.
Class 2.
Class 1.
WATER-REACTIVE MATERIAL.

Class 3.
Class 2.
Class 1.

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:
~~Aerosols~~ Aerosol products, Levels 2 and 3
Aircraft hangar (storage and repair)
Bags: cloth, burlap and paper
Bamboos and rattan
Baskets
Belting: canvas and leather
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
Silks
Soaps
Sugar
Tires, bulk storage of
Tobacco, cigars, cigarettes and snuff
Upholstery and mattresses
Wax candles

[F] 414.1.2.1 ~~Aerosols~~ Aerosol Products. *No change to text.*

Reason: This proposal brings the IFC/IBC terminology in line with the referenced standard, NFPA 30B Code for the Manufacture and Storage of Aerosol Products, 2015 Edition Also a code references that were in error are updated.

Cost Impact: Will not increase the cost of construction
There is no impact on the cost of construction as the proposal only updates terminology and references.

Report of Committee Action Hearings

Committee Action: **Approved as Submitted**

Committee Reason: This proposal provides correlation with NFPA 30B.

Assembly Action: **None**

Final Action Results

F363-16 **AS**

F363-16

[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.

15. Mercantile occupancies offering for retail sale sparklers, novelties and trick noisemakers as defined at Section 791.01, *Florida Statutes*, and that are not defined as fireworks by Chapter 791, *Florida Statutes*. Storage of sparklers and other novelties or trick noisemakers as defined in Chapter 791, *Florida Statutes*, within mercantile occupancies shall be in accordance with Section 791.055, *Florida Statutes*.

Code Change No: F372-16

Original Proposal

Section(s): 105.6.5 (New), Table 105.6.9, 202 (New), 908.8 (New) (IBC [F] 908.8), 5308.3 (New)

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

Add new text as follows:

105.6.5 Carbon dioxide enrichment systems. An operational permit is required for carbon dioxide enrichment systems having more than 874 cu. ft. scf (100 pounds) of carbon dioxide.

TABLE 105.6.9
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NTP)
Carbon dioxide enrichment systems	874 (100 lbs)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant[a]	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount

For SI: 1 cubic foot = 0.02832 m^3.

a. For carbon dioxide used in beverage dispensing applications, see Section 105.6.4.

Add new definition as follows:

CARBON DIOXIDE ENRICHMENT SYSTEM A system where carbon dioxide gas is intentionally introduced into an indoor environment, typically for the purpose of stimulating plant growth.

Add new text as follows:

908.8 Carbon dioxide enrichment systems. A gas detection system shall be provided in rooms and indoor areas in which carbon dioxide enrichment processes are located in accordance with Section 5308.3.4.

5308.3 Carbon dioxide enrichment systems. The design, installation and maintenance of carbon dioxide enrichment systems with more than 100 pounds (874 cu. feet scf) of carbon dioxide, or carbon dioxide enrichment systems with any quantity of carbon dioxide with remote fill connections shall comply with Sections 5308.3.1 through 5308.3.8.

5308.3.1 Permits. Permits shall be required as set forth in Section 105.6.5.

5308.3.2 Documentation. The following information shall be provided with the application for permit:

1. Total aggregate quantity of liquid CO2 in pounds or cubic feet at normal temperature and pressure.
2. Location and total volume of the room where the carbon dioxide enrichment operation will be conducted. Identify whether the room is at grade or below grade.
3. Location of containers relative to equipment, building openings and means of egress.
4. Manufacturer's specifications and pressure rating, including cut sheets, of all piping and tubing to be used.
5. A piping and instrumentation diagram that shows piping support and remote fill connections.
6. Details of container venting, including but not limited to vent line size, material and termination location.
7. Alarm and detection system and equipment, if applicable.
8. Seismic support for containers.

5308.3.3 Equipment. Pressure relief, vent piping, fill indicators, fill connections, vent terminations, piping system, and the storage, use, and handling of the carbon dioxide shall be in accordance with Chapter 53 and NFPA 55.

5308.3.4 Gas detection system. A continuous gas detection system shall be provided in the room or indoor area in which the carbon dioxide enrichment process is located, in the room or indoor area in which the container systems are located, and in areas where the heavier than air gas can congregate. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is most likely to accumulate or leaks are most likely to occur. The system shall be designed to detect and notify at a low level alarm and high level alarm.

1. The threshold for activation of the low level alarm shall not exceed a carbon dioxide concentration of 5,000 ppm (9,000 mg/m3) Time Weighted Average (TWA) over 8 hours.
2. The threshold for activation of the high level alarm shall not exceed a carbon dioxide concentration of 30,000 ppm (54,000 mg/m3). When carbon dioxide is detected at the high level alarm, the system shall activate an audible and visible alarm in an approved location.

5308.3.4.1 System Activation. Activation of the low level gas detection system alarm shall automatically:

1. Stop the flow of carbon dioxide to the piping system.
2. Activate the mechanical exhaust ventilation system.
3. Activate an audible and visible supervisory alarm signal at an approved location within the building.

Activation of the high level gas detection system alarm shall automatically:

1. Stop the flow of carbon dioxide to the piping system.
2. Activate the mechanical exhaust ventilation system.
3. Activate an audible and visible evacuation alarm both inside and outside of the carbon dioxide enrichment area, and the area in which the carbon dioxide containers are located.

5308.3.5 Pressurization and ventilation. Rooms or indoor areas in which carbon dioxide enrichment is provided shall be maintained at a negative pressure in relation to the surrounding areas in the building. A mechanical ventilation system shall be provided in accordance with the *International Mechanical Code* that complies with all of the following:

1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot.
2. When activated by the gas detection system the mechanical ventilation system shall remain on until manually reset.
3. The exhaust system intakes shall be taken from points within 12 inches of the floor.
4. The ventilation system piping shall terminate outdoors in an approved location.

5308.3.6 Signage. Hazard identification signs shall be posted at the entrance to the room and indoor areas where the carbon dioxide enrichment process is located, and at the entrance to the room or indoor where the carbon dioxide containers are located. The sign shall be a minimum 8 in. (200 mm) wide and 6 in. (150 mm) high and indicate:

CAUTION – CARBON DIOXIDE GAS
Ventilate the area before entering.
A high carbon dioxide (CO_2) gas concentration
In this area can cause asphyxiation.

5308.3.7 Seismic and structural design. Carbon dioxide system containers and piping shall comply with the seismic design requirements in Chapter 16 of the International Building Code and shall not exceed the floor loading limitation of the building.

5308.3.8 Container refilling. Carbon dioxide containers shall not be refilled indoors unless a remote fill connection is provided.

Reason: The number of indoor marijuana cultivation facilities is expanding rapidly across the country, and an increasing number of them are using carbon dioxide enrichment systems to stimulate plant growth. This is creating a potential asphyxiation hazard that is not currently regulated in codes or standards.

Jurisdictions where these processes are found are having to adopt local regulation to mitigate the asphyxiation hazard. The hazard is of particular concern because asphyxiant gas is intentionally being introduced into indoor occupiable rooms and areas. The hazard is the same whether the systems use liquid insulated CO_2 system or CO_2 gas containers.

The proposal is based in part on Clark County, NV guidelines, and requirements proposed for protecting insulated liquid CO_2 systems. In particular:

The 100 lb. threshold is based on insulated liquid CO_2 threshold.

The definition was created to describe the system covered.

The two level gas detection system detection levels and activation criteria is based on Clark County and the FCAC insulated liquid CO_2 system proposal.

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

Cost Impact: Will increase the cost of construction
This proposal will require a gas detection system, ventilation system and the system installation to comply with requirements that are not currently in the code.

Report of Committee Action Hearings

Committee Action: **Approve as Submitted**

Committee Reason: This proposal that addresses CO_2 enrichment was seen as necessary tool for regulation of an asphyxiation hazard. Currently the code does not address this hazard. The detection provided is adequate to provide safety to occupants.

Assembly Action: **None**

Public Comments

Public Comment 1:

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

Modify as follows:

TABLE 105.6.9
PERMIT AMOUNTS FOR COMPRESSED GASES

TYPE OF GAS	AMOUNT (cubic feet at NTP)
Carbon dioxide used in carbon dioxide enrichment systems	8754 (100 lbs)
Corrosive	200
Flammable (except cryogenic fluids and liquefied petroleum gases)	200
Highly toxic	Any Amount
Inert and simple asphyxiant[a]	6,000
Oxidizing (including oxygen)	504
Pyrophoric	Any Amount
Toxic	Any Amount

For SI: 1 cubic foot = 0.02832 m^3.
a. For carbon dioxide used in beverage dispensing applications, see Section 105.6.4.

~~**105.6.5 Carbon dioxide enrichment systems.** An operational permit is required for carbon dioxide enrichment systems having more than 874 cu. ft. scf (100 pounds) of carbon dioxide.~~

~~**908.8 Carbon dioxide enrichment systems.** A gas detection system shall be provided in rooms and indoor areas in which carbon dioxide enrichment processes are located in accordance with Section 5308.3.4.~~

~~**5308.3.1 Permits.** Permits shall be required as set forth in Section 105.6.5.~~

5307.1 General Compressed gases in storage or use not regulated by the material-specific provisions of Chapters 6, 54, 55 and 60 through 67, including asphyxiant, irritant and radioactive gases, shall comply with this section in addition to other requirements of this chapter.

Areas containing insulated liquid carbon dioxide systems used in beverage dispensing applications shall comply with Section 5307.3. Carbon dioxide enrichment systems shall comply with Section 5307.4. Areas other than those covered by Sections 5307.3 or 5307.4 shall comply with Section 5307.2.

5307.2 Ventilation Indoor storage and use areas and storage buildings shall be provided with ventilation in accordance with the requirements of Section 5004.3. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.

~~**5308.3**~~ **5307.4 Carbon dioxide enrichment systems.** The design, installation and maintenance of carbon dioxide enrichment systems with more than 100 pounds (~~874 cu. feet scf~~ 45.4 kg) of carbon dioxide, ~~or~~ and carbon dioxide enrichment systems with any quantity of carbon dioxide ~~with~~ having a remote fill ~~connections~~ connection, shall comply with Sections ~~5308.3.1~~ 5307.4.1 through ~~5308.3.8~~ 5307.4.8.

~~**5308.3.2**~~ **5307.4.1 Documentation.** *No change to text.*

~~**5308.3.3**~~ **5307.4.2 Equipment.** *No change to text.*

~~**5308.3.4**~~ **5307.4.3 Gas detection system.** A ~~continuous~~ gas detection system complying with Section 916 shall be provided in the room or indoor area in which the carbon dioxide enrichment process is located, in the room or indoor area in which the container systems are located, and in other areas where ~~the heavier than air gas can congregate~~ carbon dioxide is expected to accumulate. Carbon dioxide sensors shall be provided within 12 inches (305 mm) of the floor in the area where the gas is ~~most~~ likely expected to accumulate or leaks are most likely to occur. The system shall be designed ~~to detect and notify at a low level alarm and high level alarm~~ as follows.

~~1. The threshold for activation of the low level alarm shall not exceed a carbon dioxide concentration of 5,000 ppm (9,000 mg/m3) Time Weighted Average (TWA) over 8 hours.~~

~~2. The threshold for activation of the high-level alarm shall not exceed a carbon dioxide concentration of 30,000 ppm (54,000 mg/m3). When carbon dioxide is detected at the high-level alarm, the system shall activate an audible and visible alarm in an approved location.~~

1. Activate a low-level alarm upon detection of a carbon dioxide concentration of 5,000 ppm (9,000 mg/m3).
2. Activate a high-level alarm upon detection of a carbon dioxide concentration of 30,000 ppm (54,000 mg/m3).

~~5308.3.4.1~~ 5307.4.3.1 System Activation. *No change to text.*

~~5308.3.5~~ 5307.4.4 Pressurization and ventilation. Rooms or indoor areas in which carbon dioxide enrichment is provided shall be maintained at a negative pressure in relation to the surrounding areas in the building. A mechanical ventilation system shall be provided in accordance with the *International Mechanical Code* that complies with all of the following:

1. Mechanical ventilation in the room or area shall be at a rate of not less than 1 cubic foot per minute per square foot.
2. When activated by the gas detection system the mechanical ventilation system shall remain on until manually reset.
3. The exhaust system intakes shall be taken from points within 12 inches of the floor.
4. The ventilation system ~~piping~~ shall ~~terminate~~ discharge to the outdoors in an approved location.

5307.4.5 Signage. *No change to text.*

5307.4.6 Seismic and structural design. *No change to text.*

5307.4.7 Container refilling. Carbon dioxide containers located indoors shall not be refilled indoors unless filled from a remote ~~fill~~ connection is provided located outdoors.

Commenter's Reason: Revisions are primarily to correlate the formatting and numbering of F372-16 with F369-16. Additional revisions to the original proposal have been made for clarity and for consistency of text for provisions that are similar to those added carbon dioxide beverage dispensing systems under F369-16. Note that 908.8 of the original proposal is proposed for deletion for correlation with changes made by Code Change F75-16.

This comment should be considered after comments to F75-16 and F369-16. It is intended that the text in Code Change F372-16 for Sections 5307.1 and 5307.2 prevail over text in Code Change F369-16 if public comments to both code changes are successful.

Final Action Results

F372-16 AMPC1

F372-16

SECTION 915
CARBON MONOXIDE DETECTION
RESERVED