

**Virginia Board of Housing and Community Development  
STATEWIDE FIRE PREVENTION CODE DEVELOPMENT  
COMMITTEE  
2018 CODE CHANGE CYCLE – BOOK 5  
October 19, 2020**

**Opening Statement**

**TAB 1 – Memo**

**TAB 2 – SFPC Proposals Recommended by Workgroups as  
Consensus for Approval (approve individually or as a block)**

<b><u>Proposal Number</u></b>	<b><u>Description of Proposal</u></b>	<b><u>Page No.</u></b>
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<b><u>Proposal Number</u></b>	<b><u>Description of Proposal</u></b>	<b><u>Page No.</u></b>
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FP5003.1.1(2)	Footnote allowing unlimited refrigerant gas stored during a repair or replacement in a pressure vessel	5
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**TAB 4 – SFPC Proposals Recommended by Workgroups as Non-Consensus (approve individually)**

<b><u>Proposal Number</u></b>	<b><u>Description of Proposal</u></b>	<b><u>Page No.</u></b>
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# SFPC Edit Workgroup

**Background – BHCD October 19, 2020**

Due to concerns expressed by stakeholders, Board members and some localities, related to application of the SFPC relative to existing buildings, the BHCD directed DHCD staff to remove all unenforceable provisions of the SFPC prior to the 2015 code update cycle. Stakeholders from various organizations were invited to participate in a subworkgroup that would meet to complete this task. The 2015 subworkgroup met numerous times throughout the multi-year process. The result was mostly consensus on Chapters 1-10 with the final chapters being non-consensus. The Board approved the 2015 SFPC with the caveat that review should continue with the next code update cycle to try to garner consensus with the final chapters.

## **2018 Code Update Cycle**

The work continued during the 2018 Code Update Cycle, starting from where the Fire Code Edit Subworkgroup left off (after Chapter 10) in the SFPC. There were 10 meetings scheduled to address these edits: May 23<sup>rd</sup>, 2019; August 7<sup>th</sup>, 2019; August 14<sup>th</sup>, 2019; November 12<sup>th</sup>, 2019; January 15<sup>th</sup>, 2020; March 17<sup>th</sup>, 2020; May 28<sup>th</sup>, 2020; June 11<sup>th</sup>, 2020, July 30<sup>th</sup>, 2020, and August 20<sup>th</sup>, 2020.

The subworkgroup completed most of the final chapter work by the June 11, 2020 meeting. A proposal submitted in June that suggested additional revisions to sections in Chapters 1-10 required additional meetings. Two additional meetings were scheduled to complete this work. DHCD and the committee are pleased to report that the 2018 Code Update Cycle Fire Code Edit review process resulted in 99% consensus. The few items listed after the Non-Consensus tab are the only remaining items that did not go forward as Consensus for Approval.

The stakeholders involved in this effort worked diligently and are to be commended for their efforts over the last five years to find consensus on code sections that provide a balance of information needed by inspectors without requiring legally existing buildings to have code requirements applied retroactively.

**Total Fire Code Edit Proposals (sections amended): 1,085**

# FP101-18

Proponents: John Catlett (catlettcodeconsulting@gmail.com)

## 2015 Virginia Statewide Prevention Fire Code

### Revise as follows:

701.6 Maintenance. The required fire-resistance rating of fire-resistance-rated construction, including walls, firestops, shaft enclosures, partitions, smoke barriers, floors, protected mass timber elements, 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 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-closing or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly.

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### Add new text as follows:

**3308.9 Fire safety for buildings of Types IV-A, IV-B, and IV-C construction.** Buildings of Types IV-A, IV-B, and IV-C construction designed to be greater than six stories above grade plane shall comply with the following:

1. Standpipes provided in accordance with the applicable building code shall be maintained.
2. A water supply for fire department operations, as approved by the fire code official and the fire chief.
3. Noncombustible protection provided in accordance with the applicable building code for building elements below active mass timber construction shall be maintained.
4. Exterior wall coverings provided in accordance with the applicable building code on floor levels below active mass timber construction shall be maintained.

**Reason Statement:** This proposal brings in the companion code provisions that are required for the maintenance of tall wood buildings for continued protection from fire once constructed. A VCC proposal (BU101-18) has been submitted to create a pointer in the 2018 VCC with the 2021 Tall Wood building code package approved by the IBC General Committee by a 13 to 1 vote. It is to be included in the main body of the 2021 ICC building code. Subsequent approvals by all other ICC Code Committees that had Group A and Group B code responsibilities related to Tall Wood buildings, also referred to as Mass Timber.

Although there were intense efforts by industries that would potentially be negatively affected by approval of these proposals, Tall Wood building provisions gained approval at the ICC Public Comment Hearings held in Richmond during October of 2018 by nearly a unanimous floor vote. These proposals were approved through online voting in cdpAccess by a nearly the same margin.

Virginia localities have already been approached by designers and building owners regarding the potential use of tall wood materials. This proposal brings in the tall wood code provisions a code cycle earlier (2018) so code officials, fire officials, and designers have guidance as to the requirements developed through over two years of work by the ICC Tall Wood Buildings Ad hoc committee appointed by the ICC Board of Directors in 2015.

### Background:

The Ad Hoc Committee on Tall Wood Buildings (TWB) was created by the ICC Board to explore the science of tall wood buildings and take action on developing code changes for tall wood buildings. The TWB created several code change proposals with respect to the concept of tall buildings of mass timber and the background information is at the end of this Statement. Within the statement are important links to information, including documents and videos, used in the deliberations which resulted in these proposals.

The TWB and its various WGs held meetings, studied issues and sought input from various expert sources around the world. The TWB posted those documents and input on its website for interested parties to follow its progress and to allow those parties to, in turn, provide input to the TWB.

At its first meeting, the TWB discussed a number of performance objectives to be met with the proposed criteria for tall wood buildings:

- No collapse under reasonable scenarios of complete burn-out of fuel without automatic sprinkler protection being considered.
- No unusually high radiation exposure from the subject building to adjoining properties to present a risk of ignition under reasonably severe fire scenarios.

A PDF of additional information is attached to this proposal.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
This is a new construction method and new code language developed for the 2021 IBC. No cost impact.

**Resiliency Impact Statement:** This proposal will increase Resiliency  
Reason statement to follow

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:** Carryover to Sept 1 meeting - Fire official reps wanted to change vote on BU101 unless FP101 is approved. Need to verify with AG items 3 and 4 of this proposal. David Beahm wants the language changed to AHJ.

**Workgroup 2 - Proposed Committee Action:** Carry over to Final

**Workgroup 2 - Proposed Reason:** Interested parties requested additional time to review.

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## Public Comments for: FP101-18

This proposal doesn't have any public comments.

Proposal # 234

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# **FP107.2(1)-18**

**Proponents:** Andrew Milliken (amiliken@staffordcountyva.gov)

## **2015 Virginia Statewide Prevention Fire Code**

Table 107.2

OPERATIONAL PERMIT REQUIREMENTS (to be filled in by local jurisdiction)

DESCRIPTION	PERMIT REQUIRED(yes or no)	PERMIT FEE	INSPECTION FEE
<b>Aerosol products.</b> An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products in excess of 500 pounds (227 kg) net weight.			
<b>Amusement buildings.</b> An operational permit is required to operate a special amusement building.			
<b>Aviation facilities.</b> An operational permit is required to use a Group H or Group S occupancy for aircraft servicing or repair and aircraft fuel-servicing vehicles. Additional permits required by other sections of this code include, but are not limited to, hot work, hazardous materials and flammable or combustible finishes.			
<b>Carnivals and fairs.</b> An operational permit is required to conduct a carnival or fair.			
<b>Cellulose nitrate film.</b> An operational permit is required to store, handle or use cellulose nitrate film in a Group A occupancy.			
<b>Combustible dust-producing operations.</b> An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing combustible dusts as defined in Chapter 2.			
<b>Combustible fibers.</b> An operational permit is required for the storage and handling of combustible fibers in quantities greater than 100 cubic feet (2.8 m <sup>3</sup> ). <b>Exception:</b> An operational permit is not required for agricultural storage.			
<b>Compressed gas.</b> An operational permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in excess of the amounts listed below. <b>Exception:</b> Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.			
<b>PERMIT AMOUNTS FOR COMPRESSED GASES</b>			
<b>Type of Gas</b>	<b>Amount (cubic feet at NTP)</b>		
Corrosive	200		
Flammable (except cryogenic fluids and liquefied petroleum gases)	200		
Highly toxic	Any Amount		
Inert and simple asphyxiant	6,000		
Oxidizing (including oxygen)	504		
Pyrophoric	Any Amount		
Toxic	Any Amount		
For SI: 1 cubic foot = 0.02832 m <sup>3</sup> .			
<b>Covered and open mall buildings.</b> An operational permit is required for: 1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall.2. The display of liquid-fired or gas-fired equipment in the mall. 3. The use of open-flame or flame-producing equipment in the mall.			
<b>Cryogenic fluids.</b> An operational permit is required to produce, store, transport on site, use, handle or dispense cryogenic fluids in excess of the amounts listed below. <b>Exception:</b> Operational permits are not required for vehicles equipped for and using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the lading.			
<b>PERMIT AMOUNTS FOR CRYOGENIC FLUIDS</b>			
<b>Type of CryogenicFluid</b>	<b>Inside Building(gallons)</b>	<b>Outside Building(gallons)</b>	
Flammable	More than 1	60	
Inert	60	500	
Oxidizing (includes oxygen)	10	50	
Physical or health hazard not indicated above	Any Amount	Any Amount	
For SI: 1 gallon = 3.785 L.			
<b>Cutting and welding.</b> An operational permit is required to conduct cutting or welding operations within the jurisdiction.			

<b>Dry cleaning plants.</b> An operational permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.			
<b>Exhibits and trade shows.</b> An operational permit is required to operate exhibits and trade shows.			
<b>Explosives, fireworks, and pyrotechnics.</b> An operational permit is required for the storage, handling, sale or use of any quantity of explosive, explosive materials, <i>fireworks</i> , pyrotechnic special effects, or pyrotechnic special effects material within the scope of Chapter 56. <b>Exception:</b> Storage in Group R-3 or R-5 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale, and in accordance with the quantity limitations and conditions set forth in Section 5601.1, Exceptions 4 and 12.			
<b>Explosives, restricted manufacture.</b> An operational permit is required for the restricted manufacture of explosives within the scope of Chapter 56.			
<b>Explosives, unrestricted manufacture.</b> An operational permit is required for the unrestricted manufacture of explosives within the scope of Chapter 56			
<b>Fire hydrants and valves.</b> An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and accessible to a fire apparatus access road that is open to or generally used by the public. <b>Exception:</b> An operational 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.			
<b>Flammable and combustible liquids.</b> An operational permit is required: 1. To use or operate a pipeline for the transportation within facilities of flammable or combustible liquids. This requirement shall not apply to the offsite transportation in pipelines regulated by the U.S. Department of Transportation (DOTn) nor does it apply to piping systems. 2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following: 2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the fire official, would cause an unsafe condition. 2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days. 3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment. 4. To remove Class I or Class II liquids from an underground storage tank used for fueling motor vehicles by any means other than the <i>approved</i> , stationary on-site pumps normally used for dispensing purposes. 5. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used. 6. To install, alter, remove, abandon, place temporarily out of service (for more than 90 days) or otherwise dispose of an underground, protected above-ground or above-ground flammable or combustible liquid tank. 7. To change the type of contents stored in a flammable or combustible liquid tank to a material that poses a greater hazard than that for which the tank was designed and constructed. 8. To manufacture, process, blend or refine flammable or combustible liquids.			
<b>Floor finishing.</b> An operational permit is required for floor finishing or surfacing operations exceeding 350 square feet (33 m <sup>2</sup> ) using Class I or Class II liquids.			
<b>Fruit and crop ripening.</b> An operational permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.			
<b>Fumigation, thermal, and insecticidal fogging.</b> An operational permit is required to operate a business of fumigation, thermal, or insecticidal fogging and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.			
<b>Hazardous materials.</b> An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the amounts listed below.			
<b>PERMIT AMOUNTS FOR HAZARDOUS MATERIALS</b>			
<b>Type of Material</b>	<b>Amount</b>		
Combustible liquids	See flammable and combustible liquids		
Corrosive materials			
Gases	See compressed gases		
Liquids	55 gallons		
Solids	1000 pounds		
Explosive materials	See explosives		

Flammable materials	
Gases	See compressed gases
Liquids	See flammable and combustible liquids
Solids	100 pounds
Highly toxic materials	
Gases	See compressed gases
Liquids	Any amount
Solids	Any amount
Oxidizing materials	
Gases	See compressed gases
Liquids	
Class 4	Any amount
Class 3	1 gallon <sup>a</sup>
Class 2	10 gallons
Class 1	55 gallons
Solids	
Class 4	Any amount
Class 3	10 pounds <sup>b</sup>
Class 2	100 pounds
Class 1	500 pounds
Organic peroxides	
Liquids	
Class I	Any amount
Class II	Any amount
Class III	1 gallon
Class IV	2 gallons
Class V	No permit required
Solids	
Class I	Any amount
Class II	Any amount
Class III	10 pounds
Class IV	20 pounds
Class V	No permit required
Pyrophoric materials	
Gases	See compressed gases
Liquids	Any amount
Solids	Any amount
Toxic materials	
Gases	See compressed gases
Liquids	10 gallons
Solids	100 pounds
Unstable (reactive) materials	
Liquids	
Class 4	Any amount
Class 3	Any amount
Class 2	5 gallons

Class 1	10 gallons		
Solids			
Class 4	Any amount		
Class 3	Any amount		
Class 2	50 pounds		
Class 1	100 pounds		
Water reactive materials			
Liquids			
Class 3	Any amount		
Class 2	5 gallons		
Class 1	55 gallons		
Solids			
Class 3	Any amount		
Class 2	50 pounds		
Class 1	500 pounds		
For SI: 1 gallon = 3.785 L, 1 pound = 0.454 kg. a. Twenty gallons when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 20 gallons or less. b. Two hundred pounds when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 200 pounds or less.			
<b>HPM facilities.</b> An operational permit is required to store, handle or use hazardous production materials.			
<b>High piled storage.</b> An operational permit is required to use a building or portion thereof as a high-piled storage area exceeding 500 square feet (46 m <sup>2</sup> ).			
<b>Hot work operations.</b> An operational permit is required for hot work including, but not limited to: 1. Public exhibitions and demonstrations where hot work is conducted. 2. Use of portable hot work equipment inside a structure. <b>Exception:</b> Work that is conducted under a construction permit. 3. Fixed-site hot work equipment such as welding booths. 4. Hot work conducted within a hazardous fire area. 5. Application of roof coverings with the use of an open-flame device. 6. When <i>approved</i> , the fire official shall issue a permit to carry out a Hot Work Program. This program allows <i>approved</i> personnel to regulate their facility's hot work operations. The <i>approved</i> personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in this chapter. These permits shall be issued only to their employees or hot work operations under their supervision.			
<b>Industrial ovens.</b> An operational permit is required for operation of industrial ovens regulated by Chapter 30.			
<b>Lumber yards and woodworking plants.</b> An operational permit is required for the storage or processing of lumber exceeding 100,000 board feet (8,333 ft <sup>3</sup> ) (236 m <sup>3</sup> ).			
<b>Liquid-fueled or gas-fueled vehicles or equipment in assembly buildings.</b> An operational permit is required to display, operate or demonstrate liquid-fueled or gas-fueled vehicles or equipment in assembly buildings.			
<b>LP-gas.</b> An operational permit is required for: 1. Storage and use of LP-gas. <b>Exception:</b> An operational permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies in Group R-3.2. Operation of cargo tankers that transport LP-gas.			
<b>Magnesium.</b> An operational permit is required to melt, cast, heat treat or grind more than 10 pounds (4.54 kg) of magnesium.			
<b>Miscellaneous combustible storage.</b> An operational permit is required to store in any building or upon any premises in excess of 2,500 cubic feet (71 m <sup>3</sup> ) gross volume of combustible empty packing cases, boxes, barrels or similar containers, rubber tires, rubber, cork or similar combustible material.			
<b>Mobile food preparation vehicles.</b> A permit is required for <i>mobile food preparation vehicles</i> equipped with appliances that produce smoke or grease laden vapors. <b>Exception:</b> Recreational vehicles used for private recreation.			
<b>Open burning.</b> An operational permit is required for the kindling or maintaining of an open fire or a fire on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be adhered to. <b>Exception:</b> Recreational fires.			

<b>Open flames and candles.</b> An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.			
<b>Open flames and torches.</b> An operational permit is required to remove paint with a torch, or to use a torch or open-flame device in a wildfire risk area.			
<b>Organic coatings.</b> An operational permit is required for any organic-coating manufacturing operation producing more than 1 gallon (4 L) of an organic coating in one day.			
<b>Places of assembly.</b> An operational permit is required to operate a place of assembly.			
<b>Private fire hydrants.</b> An operational permit is required for the removal from service, use or operation of private fire hydrants. <b>Exception:</b> An operational permit is not required for private industry with trained maintenance personnel, private fire brigade or fire departments to maintain, test and use private hydrants.			
<b>Pyrotechnic special effects material.</b> An operational permit is required for use and handling of pyrotechnic special effects material.			
<b>Pyroxylin plastics.</b> An operational permit is required for storage or handling of more than 25 pounds (11 kg) of cellulose nitrate (pyroxylin) plastics and for the assembly or manufacture of articles involving pyroxylin plastics.			
<b>Refrigeration equipment.</b> An operational permit is required to operate a mechanical refrigeration unit or system regulated by Chapter 6.			
<b>Repair garages and service stations.</b> An operational permit is required for operation of repair garages and automotive, marine and fleet service stations.			
<b>Rooftop heliports.</b> An operational permit is required for the operation of a rooftop heliport.			
<b>SRCFs.</b> <u>An operational permit is required for the operation of a State-Regulated Care Facility where inspection by the fire official is required by state licensing regulations.</u>			
<b>Spraying or dipping.</b> An operational permit is required to conduct a spraying or dipping operation utilizing flammable or combustible liquids or the application of combustible powders regulated by Chapter 24.			
<b>Storage of scrap tires and tire byproducts.</b> An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71 m <sup>3</sup> ) of total volume of scrap tires and for indoor storage of tires and tire byproducts.			
<b>Temporary membrane structures and tents.</b> An operational permit is required to operate an air-supported temporary membrane structure or a tent. <b>Exceptions:</b> 1. Tents used exclusively for recreational camping purposes. 2. Tents and air-supported structures that cover an area of 900 square feet (84 m <sup>2</sup> ) or less, including all connecting areas or spaces with a common means of egress or entrance and with an occupant load of 50 or less persons.			
<b>Tire-rebuilding plants.</b> An operational permit is required for the operation and maintenance of a tire-rebuilding plant.			
<b>Waste handling.</b> An operational permit is required for the operation of wrecking yards, junk yards and waste material-handling facilities.			
<b>Wood products.</b> An operational permit is required to store chips, hogged material, lumber or plywood in excess of 200 cubic feet (6 m <sup>3</sup> ).			

**Reason Statement:** This proposal adds an additional operational permit for localities to consider using to protect their State Regulated Care Facilities (SCFRs) and recover costs from state-mandated inspections. Administrative regulation changes in the Department of Social Services and other agencies regulating SRCFs have recently changed to require inspection of childcare and other facilities by the local fire official (22VAC40-185-260 - <https://www.dss.virginia.gov/family/cc/index.cgi>). Prior to this change, such requests were less frequent and most localities simply preformed this inspection without cost recovery. Given the increasing demands on local agency staff and limited budgets, it is important to provide these agencies a means for cost recovery of this mandated service. This proposal intends to provide communities with the ability for cost recovery while making sure that these hazards are being properly operated and maintained.

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

**Resiliency Impact Statement:** This proposal will increase Resiliency

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## Workgroup Recommendation

**Workgroup 1 - Final Committee Action:** Consensus Approval

**Workgroup 1 - Final Reason:**

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## **Public Comments for: FP107.2(1)-18**

This proposal doesn't have any public comments.

Proposal # 328

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# **FP107.2(2)-18**

**Proponents:** Andrew Milliken (amiliken@staffordcountyva.gov)

## **2015 Virginia Statewide Prevention Fire Code**

Table 107.2

OPERATIONAL PERMIT REQUIREMENTS (to be filled in by local jurisdiction)

DESCRIPTION	PERMIT REQUIRED(yes or no)	PERMIT FEE	INSPECTION FEE
<b>Aerosol products.</b> An operational permit is required to manufacture, store or handle an aggregate quantity of Level 2 or Level 3 aerosol products in excess of 500 pounds (227 kg) net weight.			
<b>Amusement buildings.</b> An operational permit is required to operate a special amusement building.			
<b>Aviation facilities.</b> An operational permit is required to use a Group H or Group S occupancy for aircraft servicing or repair and aircraft fuel-servicing vehicles. Additional permits required by other sections of this code include, but are not limited to, hot work, hazardous materials and flammable or combustible finishes.			
<b>Carnivals and fairs.</b> An operational permit is required to conduct a carnival or fair.			
<b>Cellulose nitrate film.</b> An operational permit is required to store, handle or use cellulose nitrate film in a Group A occupancy.			
<b>Combustible dust-producing operations.</b> An operational permit is required to operate a grain elevator, flour starch mill, feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices or sugar, or other operations producing combustible dusts as defined in Chapter 2.			
<b>Combustible fibers.</b> An operational permit is required for the storage and handling of combustible fibers in quantities greater than 100 cubic feet (2.8 m <sup>3</sup> ). <b>Exception:</b> An operational permit is not required for agricultural storage.			
<b>Commercial Cooking.</b> An operational permit is required for the operation of commercial cooking appliances in occupancies other than assembly occupancies or dwellings.			
<b>Compressed gas.</b> An operational permit is required for the storage, use or handling at normal temperature and pressure (NTP) of compressed gases in excess of the amounts listed below. <b>Exception:</b> Vehicles equipped for and using compressed gas as a fuel for propelling the vehicle.			
<b>PERMIT AMOUNTS FOR COMPRESSED GASES</b>			
<b>Type of Gas</b>	<b>Amount (cubic feet at NTP)</b>		
Corrosive	200		
Flammable (except cryogenic fluids and liquefied petroleum gases)	200		
Highly toxic	Any Amount		
Inert and simple asphyxiant	6,000		
Oxidizing (including oxygen)	504		
Pyrophoric	Any Amount		
Toxic	Any Amount		
For SI: 1 cubic foot = 0.02832 m <sup>3</sup> .			
<b>Covered and open mall buildings.</b> An operational permit is required for: 1. The placement of retail fixtures and displays, concession equipment, displays of highly combustible goods and similar items in the mall.2. The display of liquid-fired or gas-fired equipment in the mall. 3. The use of open-flame or flame-producing equipment in the mall.			
<b>Cryogenic fluids.</b> An operational permit is required to produce, store, transport on site, use, handle or dispense cryogenic fluids in excess of the amounts listed below. <b>Exception:</b> Operational permits are not required for vehicles equipped for and using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the lading.			
<b>PERMIT AMOUNTS FOR CRYOGENIC FLUIDS</b>			
<b>Type of Cryogenic Fluid</b>	<b>Inside Building(gallons)</b>	<b>Outside Building(gallons)</b>	
Flammable	More than 1	60	
Inert	60	500	
Oxidizing (includes oxygen)	10	50	
Physical or health hazard not indicated above	Any Amount	Any Amount	
For SI: 1 gallon = 3.785 L.			

<b>Cutting and welding.</b> An operational permit is required to conduct cutting or welding operations within the jurisdiction.			
<b>Dry cleaning plants.</b> An operational permit is required to engage in the business of dry cleaning or to change to a more hazardous cleaning solvent used in existing dry cleaning equipment.			
<b>Exhibits and trade shows.</b> An operational permit is required to operate exhibits and trade shows.			
<b>Explosives, fireworks, and pyrotechnics.</b> An operational permit is required for the storage, handling, sale or use of any quantity of explosive, explosive materials, <i>fireworks</i> , pyrotechnic special effects, or pyrotechnic special effects material within the scope of Chapter 56. <b>Exception:</b> Storage in Group R-3 or R-5 occupancies of smokeless propellant, black powder and small arms primers for personal use, not for resale, and in accordance with the quantity limitations and conditions set forth in Section 5601.1, Exceptions 4 and 12.			
<b>Explosives, restricted manufacture.</b> An operational permit is required for the restricted manufacture of explosives within the scope of Chapter 56.			
<b>Explosives, unrestricted manufacture.</b> An operational permit is required for the unrestricted manufacture of explosives within the scope of Chapter 56			
<b>Fire hydrants and valves.</b> An operational permit is required to use or operate fire hydrants or valves intended for fire suppression purposes that are installed on water systems and accessible to a fire apparatus access road that is open to or generally used by the public. <b>Exception:</b> An operational 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.			
<b>Flammable and combustible liquids.</b> An operational permit is required: 1. To use or operate a pipeline for the transportation within facilities of flammable or combustible liquids. This requirement shall not apply to the offsite transportation in pipelines regulated by the U.S. Department of Transportation (DOTn) nor does it apply to piping systems. 2. To store, handle or use Class I liquids in excess of 5 gallons (19 L) in a building or in excess of 10 gallons (37.9 L) outside of a building, except that a permit is not required for the following: 2.1. The storage or use of Class I liquids in the fuel tank of a motor vehicle, aircraft, motorboat, mobile power plant or mobile heating plant, unless such storage, in the opinion of the fire official, would cause an unsafe condition. 2.2. The storage or use of paints, oils, varnishes or similar flammable mixtures when such liquids are stored for maintenance, painting or similar purposes for a period of not more than 30 days. 3. To store, handle or use Class II or Class IIIA liquids in excess of 25 gallons (95 L) in a building or in excess of 60 gallons (227 L) outside a building, except for fuel oil used in connection with oil-burning equipment. 4. To remove Class I or Class II liquids from an underground storage tank used for fueling motor vehicles by any means other than the <i>approved</i> , stationary on-site pumps normally used for dispensing purposes. 5. To operate tank vehicles, equipment, tanks, plants, terminals, wells, fuel-dispensing stations, refineries, distilleries and similar facilities where flammable and combustible liquids are produced, processed, transported, stored, dispensed or used. 6. To install, alter, remove, abandon, place temporarily out of service (for more than 90 days) or otherwise dispose of an underground, protected above-ground or above-ground flammable or combustible liquid tank. 7. To change the type of contents stored in a flammable or combustible liquid tank to a material that poses a greater hazard than that for which the tank was designed and constructed. 8. To manufacture, process, blend or refine flammable or combustible liquids.			
<b>Floor finishing.</b> An operational permit is required for floor finishing or surfacing operations exceeding 350 square feet (33 m <sup>2</sup> ) using Class I or Class II liquids.			
<b>Fruit and crop ripening.</b> An operational permit is required to operate a fruit- or crop-ripening facility or conduct a fruit-ripening process using ethylene gas.			
<b>Fumigation, thermal, and insecticidal fogging.</b> An operational permit is required to operate a business of fumigation, thermal, or insecticidal fogging and to maintain a room, vault or chamber in which a toxic or flammable fumigant is used.			
<b>Hazardous materials.</b> An operational permit is required to store, transport on site, dispense, use or handle hazardous materials in excess of the amounts listed below.			
<b>PERMIT AMOUNTS FOR HAZARDOUS MATERIALS</b>			
<b>Type of Material</b>	<b>Amount</b>		
Combustible liquids	See flammable and combustible liquids		
Corrosive materials			
Gases	See compressed gases		
Liquids	55 gallons		

Solids	1000 pounds
Explosive materials	See explosives
Flammable materials	
Gases	See compressed gases
Liquids	See flammable and combustible liquids
Solids	100 pounds
Highly toxic materials	
Gases	See compressed gases
Liquids	Any amount
Solids	Any amount
Oxidizing materials	
Gases	See compressed gases
Liquids	
Class 4	Any amount
Class 3	1 gallon <sup>a</sup>
Class 2	10 gallons
Class 1	55 gallons
Solids	
Class 4	Any amount
Class 3	10 pounds <sup>b</sup>
Class 2	100 pounds
Class 1	500 pounds
Organic peroxides	
Liquids	
Class I	Any amount
Class II	Any amount
Class III	1 gallon
Class IV	2 gallons
Class V	No permit required
Solids	
Class I	Any amount
Class II	Any amount
Class III	10 pounds
Class IV	20 pounds
Class V	No permit required
Pyrophoric materials	
Gases	See compressed gases
Liquids	Any amount
Solids	Any amount
Toxic materials	
Gases	See compressed gases
Liquids	10 gallons
Solids	100 pounds
Unstable (reactive) materials	
Liquids	
Class 4	Any amount

Class 3	Any amount		
Class 2	5 gallons		
Class 1	10 gallons		
Solids			
Class 4	Any amount		
Class 3	Any amount		
Class 2	50 pounds		
Class 1	100 pounds		
Water reactive materials			
Liquids			
Class 3	Any amount		
Class 2	5 gallons		
Class 1	55 gallons		
Solids			
Class 3	Any amount		
Class 2	50 pounds		
Class 1	500 pounds		
For SI: 1 gallon = 3.785 L, 1 pound = 0.454 kg. a. Twenty gallons when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 20 gallons or less. b. Two hundred pounds when Table 5003.1.1(1) Note k applies and hazard identification signs in accordance with Section 5003.5 are provided for quantities of 200 pounds or less.			
<b>HPM facilities.</b> An operational permit is required to store, handle or use hazardous production materials.			
<b>High piled storage.</b> An operational permit is required to use a building or portion thereof as a high-piled storage area exceeding 500 square feet (46 m <sup>2</sup> ).			
<b>Hot work operations.</b> An operational permit is required for hot work including, but not limited to: 1. Public exhibitions and demonstrations where hot work is conducted. 2. Use of portable hot work equipment inside a structure. <b>Exception:</b> Work that is conducted under a construction permit. 3. Fixed-site hot work equipment such as welding booths. 4. Hot work conducted within a hazardous fire area. 5. Application of roof coverings with the use of an open-flame device. 6. When <i>approved</i> , the fire official shall issue a permit to carry out a Hot Work Program. This program allows <i>approved</i> personnel to regulate their facility's hot work operations. The <i>approved</i> personnel shall be trained in the fire safety aspects denoted in this chapter and shall be responsible for issuing permits requiring compliance with the requirements found in this chapter. These permits shall be issued only to their employees or hot work operations under their supervision.			
<b>Industrial ovens.</b> An operational permit is required for operation of industrial ovens regulated by Chapter 30.			
<b>Lumber yards and woodworking plants.</b> An operational permit is required for the storage or processing of lumber exceeding 100,000 board feet (8,333 ft <sup>3</sup> ) (236 m <sup>3</sup> ).			
<b>Liquid-fueled or gas-fueled vehicles or equipment in assembly buildings.</b> An operational permit is required to display, operate or demonstrate liquid-fueled or gas-fueled vehicles or equipment in assembly buildings.			
<b>LP-gas.</b> An operational permit is required for: 1. Storage and use of LP-gas. <b>Exception:</b> An operational permit is not required for individual containers with a 500-gallon (1893 L) water capacity or less or multiple container systems having an aggregate quantity not exceeding 500 gallons (1893 L), serving occupancies in Group R-3.2. Operation of cargo tankers that transport LP-gas.			
<b>Magnesium.</b> An operational permit is required to melt, cast, heat treat or grind more than 10 pounds (4.54 kg) of magnesium.			
<b>Miscellaneous combustible storage.</b> An operational permit is required to store in any building or upon any premises in excess of 2,500 cubic feet (71 m <sup>3</sup> ) gross volume of combustible empty packing cases, boxes, barrels or similar containers, rubber tires, rubber, cork or similar combustible material.			
<b>Mobile food preparation vehicles.</b> A permit is required for <i>mobile food preparation vehicles</i> equipped with appliances that produce smoke or grease laden vapors. <b>Exception:</b> Recreational vehicles used for private recreation.			
<b>Open burnina.</b> An operational permit is required for the kindling or maintaining of an open fire or a fire on			

<b>Open burning.</b> An operational permit is required for the burning or maintaining of an opening or flame on any public street, alley, road, or other public or private ground. Instructions and stipulations of the permit shall be adhered to. <b>Exception:</b> Recreational fires.			
<b>Open flames and candles.</b> An operational permit is required to use open flames or candles in connection with assembly areas, dining areas of restaurants or drinking establishments.			
<b>Open flames and torches.</b> An operational permit is required to remove paint with a torch, or to use a torch or open-flame device in a wildfire risk area.			
<b>Organic coatings.</b> An operational permit is required for any organic-coating manufacturing operation producing more than 1 gallon (4 L) of an organic coating in one day.			
<b>Places of assembly.</b> An operational permit is required to operate a place of assembly.			
<b>Private fire hydrants.</b> An operational permit is required for the removal from service, use or operation of private fire hydrants. <b>Exception:</b> An operational permit is not required for private industry with trained maintenance personnel, private fire brigade or fire departments to maintain, test and use private hydrants.			
<b>Pyrotechnic special effects material.</b> An operational permit is required for use and handling of pyrotechnic special effects material.			
<b>Pyroxylin plastics.</b> An operational permit is required for storage or handling of more than 25 pounds (11 kg) of cellulose nitrate (pyroxylin) plastics and for the assembly or manufacture of articles involving pyroxylin plastics.			
<b>Refrigeration equipment.</b> An operational permit is required to operate a mechanical refrigeration unit or system regulated by Chapter 6.			
<b>Repair garages and service stations.</b> An operational permit is required for operation of repair garages and automotive, marine and fleet service stations.			
<b>Rooftop heliports.</b> An operational permit is required for the operation of a rooftop heliport.			
<b>Spraying or dipping.</b> An operational permit is required to conduct a spraying or dipping operation utilizing flammable or combustible liquids or the application of combustible powders regulated by Chapter 24.			
<b>Storage of scrap tires and tire byproducts.</b> An operational permit is required to establish, conduct or maintain storage of scrap tires and tire byproducts that exceeds 2,500 cubic feet (71 m <sup>3</sup> ) of total volume of scrap tires and for indoor storage of tires and tire byproducts.			
<b>Temporary membrane structures and tents.</b> An operational permit is required to operate an air-supported temporary membrane structure or a tent. <b>Exceptions:</b> 1. Tents used exclusively for recreational camping purposes. 2. Tents and air-supported structures that cover an area of 900 square feet (84 m <sup>2</sup> ) or less, including all connecting areas or spaces with a common means of egress or entrance and with an occupant load of 50 or less persons.			
<b>Tire-rebuilding plants.</b> An operational permit is required for the operation and maintenance of a tire-rebuilding plant.			
<b>Waste handling.</b> An operational permit is required for the operation of wrecking yards, junk yards and waste material-handling facilities.			
<b>Wood products.</b> An operational permit is required to store chips, hogged material, lumber or plywood in excess of 200 cubic feet (6 m <sup>3</sup> ).			

**Reason Statement:** This proposal adds an additional operational permit for localities to consider using to protect their restaurant and commercial cooking businesses. The numbers speak for themselves regarding the hazard and financial impact that these fires have in communities throughout the Commonwealth and nation. According to the NFPA, approximately 61% of all restaurant fires between 2010 and 2014 were caused by cooking – with cooking equipment or materials being the most frequent items initially ignited and therefore the cause of the fire. This makes up three out of five fires and 38% of direct property damage. Approximately 22% of these fires were a result of failure to clean, 14% electrical failure or malfunction, 12% mechanical failure or malfunction and 8% unattended equipment. Deep fryers were involved in one of five fires (21%), ranges or cooktops in 14% of fires, cooking grills in 6%, and ovens or rotisserie ovens in 5%. These fires resulted in direct property damage of \$165 million annually. Although permits are already required for locations that have occupant loads of more than 50 persons (Assembly), there are numerous cooking operations that are not routinely inspected to ensure that proper cleaning and maintenance is being completed. In fact, even food trucks with commercial cooking equipment with grease-laden vapors are subject to permits and inspections but similar operations in "brick and mortar" businesses that are often attached to other occupied spaces have no such requirement. This proposal intends to provide communities with the ability to ensure that these hazards are being properly operated and maintained.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction. This proposal applies to existing cooking operations and does not require construction.

**Resiliency Impact Statement:** This proposal will increase Resiliency

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## **Workgroup Recommendation**

**Workgroup 1 - Final Committee Action:** Consensus Approval

**Workgroup 1 - Final Reason:**

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## **Public Comments for: FP107.2(2)-18**

This proposal doesn't have any public comments.

Proposal # 330

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# Chapter One – Commercial Kitchen Fires

**COMMERCIAL KITCHEN FIRES** .....2

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*Restaurant going up in smoke*



*Fire is a good servant but a poor master*

# Commercial Kitchen Fires

## The Commercial Kitchen Fire Problem

Fires involving commercial cooking equipment are a significant part of the North American fire problem.

The vast majority of accidental structural damaging fires over commercial cooking appliances are poor construction and installation and poor maintenance practices. The Model Codes provide for construction and installation expectations that can withstand and extinguish a fire under the ventilation system. The hard reality is because of inadequate construction clearances, maintenance of the extinguishing system and the ever-constant accumulation of grease vapor deposits commercial cooking areas remain a continuing fire problem. This manual is an effort to reduce the number of, and extent of damages from this hazard.

Canadian national statistics have not been compiled since 2002; however, in 2002 there were 832 fires reported in eating and drinking establishments causing \$48.5 million dollars in damage and 42 injuries.<sup>1</sup> In the U.S., according to NFPA statistics for the years 2004-2008, an estimated average of 8,160 structure fires involving commercial cooking equipment or ventilation components were reported in these properties per year, causing an annual average of three civilian deaths, 100 civilian fire injuries, and \$229 million in direct property damage. Fifty-five percent of the structure fires in eating and drinking establishments began in the kitchen or cooking area; these fires caused 59% of the civilian injuries and 29% of the direct property damage.<sup>2</sup> See Table: *Structure Fires in Eating and Drinking Establishments by Area of Origin* on page 12, and Table 2: *Structure Fires in Eating and Drinking Establishments by Equipment Involved in Ignition* on page 13, for more areas of origin and fire ignition detail.<sup>3</sup>

## Unreported Fires

The only statistics that can be compiled, of course, are on fires reported to the fire department. But there are strong indications that (a) unreported fires actually dwarf the number of reported fires; and (b) that unreported fires are disproportionately likely to show up in kitchens. The majority of these are small nuisance fires which are successfully extinguished by individuals who do not subsequently feel a need to contact the fire department.

A 1974 study in one US city found that only about 11% of the total fires were reported.<sup>4</sup> A much larger, more recent study<sup>5</sup> found that only 4% of the total fires were reported and that the majority (76.4%) of *unreported* fires took place in the kitchen.<sup>6</sup> While these surveys on unreported fires focused on domestic premises, it is easy to see that the same concepts can apply to commercial kitchens. Fires tend to be unreported when the occupants can take effective suppression action (or fire may burn itself out) not requiring professional help. In a commercial kitchen, inviting the fire department to come in may not be good customer relations, thus, an additional disincentive exists for calling in the professionals when in-house staff are able to cope themselves.

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<sup>1</sup> These figures include eating and drinking establishments (Assembly and Mercantile occupancies as per the NBCC). The level of detail of data collected does not permit a determination of whether CKV (Commercial Kitchen Ventilation) systems were involved. Data is from the Canadian Council of Fire Marshals and Fire Commissioners. [http://www.ccfmfc.ca/stats/en/report\\_e\\_02.pdf](http://www.ccfmfc.ca/stats/en/report_e_02.pdf)

<sup>2</sup> Everts, Ben, Marty, US Structure Fires in Eating and Drinking Establishments, NFPA, November 2010.

<sup>3</sup> In the NFPA data tables, "Duct" is listed under Area of Origin; and "Grease hood or duct" is listed under cooking equipment fire causes. The investigator is cautioned to consider what ignition source is actually available in the exhaust system per se. Several of the authors experiences are that duct origins are very rare, and even then such as a fugitive ember from a solid fuel burning appliance; are likely associated with an ignition source such as an exhaust fan, which is a component of the exhaust system; or the origin could have been external (but in close proximity) to the duct. For example, a flare-up from a deep fat fryer, which ignites grease in the exhaust system, should be coded as "Kitchen" under Area of Origin and "Deep Fryer" under Cause (Equipment Involved).

<sup>4</sup> Crossman, E. R. F. W., Zachary, W. B., and Pigman, W., FIRRST: A Fire Risk and Readiness Study of Berkeley Households, 1974, *Fire J.* 71:1, 67-73 (Jan.1977).

<sup>5</sup> 1984 National Sample Survey of Unreported, Residential Fires (Contract No. C-83-1239), prepared for CPSC, Audits & Surveys, Princeton NJ (1985).

<sup>6</sup> Fires in the Home: findings of the 2001/2 British Crime Survey, Office of the Deputy Prime Minister, London (2004); Fires in the Home: findings of the 2003/4 British Crime Survey (2006); Fires in the Home: findings from the 2004/05 Survey of English Housing (2006).

Although this manual will focus on Commercial Eating and Drinking Establishments, a commercial cooking fire in other occupancies can have an equally devastating effect. The leading cause (at 50%) of confined fires in medical, mental health and substance abuse facilities in the period 2003-2006 was due to cooking equipment.<sup>7</sup> The information in this manual will be equally effective in investigating fires in other occupancies.

The commercial cooking equipment fire data can provide useful information for consideration in investigating and analyzing fires on this equipment including the development and testing of a fire causation hypothesis.

### Cooking By-Products

As stated, grease vapor accumulation is one of the most serious hazards to a commercial cooking area. Proper management of this hazard, a very achievable task, would greatly reduce the risk of more serious fires.

During cooking, oils and fats change from a solid or semi-solid state into a liquid form. They then atomize and form grease laden vapors, or drain off in the form of altered oils. These grease vapors contain water molecules in the form of steam, mixed with evaporated fats and oils. Particles of this mixture are called aerosols. These aerosols are carried from the cooking surface into the hood by the negative pressure created by the ventilation system and thermal currents created by cooking appliances. This generates a plume or rising cloud of grease and smoke.

The higher the cooking surface temperature becomes, the more grease is transformed into a vapor state. As this vapor cools, it condenses or returns to a solid state (although chemically altered). This grease residue (altered oils) is combustible. Its ignition temperatures are slightly below the average ignition temperature of the original cooking oil. So, instead of exhausting the grease hazard, the exhaust system actually becomes a fire hazard.

The combination of various appliances, different food products and the ways in which they are cooked will produce an array of grease residues.

An inspector needs to encourage restaurant to fulfill their NFPA 96 responsibility to stay on a regular cleaning schedule, so that the buildup does not become too great.

From a practical perspective, grease generation falls into two essential categories: stir-fry/deep-fry versus element cooked (i.e. broilers, grills, stovetops, etc.). The following is a generally accepted chart that ranks cooking styles and grease accumulation, in order of volume. Average surface temperatures of these appliances are also listed.



*Fire in a cheese melter*



*Plenum area of a hood. The fire-extinguishing system link and nozzle are covered with grease from Asian cooking.*



*Grease accumulation from gas char broiler (predominantly hamburger cooking) in a horizontal section of ducting*

<sup>7</sup> Flynn, Jennifer, Structure Fires in Medical, Mental Health, and Substance Abuse Facilities, NFPA, February 2009.

## Grease Accumulation Severity

### Element Cooking:

Severity	Product	Fuel	Approximate Appliance Temperature
1	Fish - especially salmon and halibut	Mesquite charbroilers	816 - 1093°C (1500 - 2000°F)
2	Steaks beef, pork, lamb	Mesquite charbroilers	816 - 1093°C (1500 - 2000°F)
3	Hamburgers	Mesquite charbroilers	816 - 1093°C (1500 - 2000°F)
4	Steaks beef, pork, lamb	Charbroiler	816°C (1500°F)
5	Hamburgers	Charbroiler	816°C (1500°F)
6	Hamburgers	On a grooved grill	260° - 316°C (500 - 600°F)
7	Bacon / sausage	On a flat grill	191°C (375°F)
8	Other cooking	Elec./gas ovens and steamers	99°C (210°F)

### Stir/Deep-Fried:

Severity	Product	Fuel	Approximate Appliance Temperature
1	High tech fat fryers	Gas	316°C (600°F)
2	Breaded chicken or fish	Gas	191°C (375°F)
3	Asian wok	Gas	260°C (500°F)
4	Frozen French fries or pies	Gas	191°C (375°F)

Charts courtesy of R. J. Reynolds, Inc.<sup>8</sup>

Also see NFPA 96, Table 11.4 Schedule of Inspection for Grease Buildup.

### Solid Fuel Cooked/Charbroiler Grease

Solid fuel is normally used to cook/charbroil various kinds of meat, including beef steaks, burgers and fish. Charbroiling meats creates high volumes of grease. Solid fuel poses the additional problem of ash that mixes with the grease from the meat to create unusually large volumes of buildup.

Initially, a dry but adhesive stain of grease (like a nicotine stain) forms directly against the metal surface. On top of this staining, layers of thick, heavy, black carbon will build up. It is not unusual to encounter accumulations of grease 19 mm to 25.4 mm thick (3/4 in. to 1 in.) on vertical surfaces and along the inside top of horizontal ducting. Where systems are not regularly cleaned, as much as 7.5 cm (3 in.) of grease can accumulate on the bottom of horizontal duct sections.



*Looking into a duct opening found in the suspended ceiling. The access panel is on the right. Primary accumulation of gas charbroiler.*



*Examples of grease created by solid fuel charbroiler cooking*

<sup>8</sup> With increased accumulation of grease (fuel) comes the potential for increased intensity of a fire within the exhaust system.

### Deep Fryer Grease

Deep frying creates grease that is very much like translucent creosote. When there is a large amount of water in the foods cooked, as in the case of frozen food, the buildup can have an almost shiny appearance. It is as hard as multiple layers of shellac.

High volume grease-producing foods include: potatoes (starch), sugar based foods (i.e. pies and turnovers, sugar = carbon) and frozen products (ice = moisture). Fresh breaded foods such as battered chicken or fish can create large volumes of rather soft (flour filled) grease.



*Grease leaking out of a faulty valve under a deep fryer*



*Grease, created by deep fryer cooking, dripping off a fire suppression nozzle*

### Wok Grease

The nature of wok cooking creates grease that is a very sticky, syrup-like liquid, having a consistency between honey and molasses. Once this grease residue has set on a metal surface for some time and has been exposed to temperature changes, it becomes extremely adhesive, with a flexible caramel-like consistency. The surface tension cannot be broken by normal scraping or with general purpose cleaning chemicals. After a further length of time it becomes dry and hard, similar to tar. This type of grease can readily plug up the pull cable of the fire-extinguishing system.



*Examples of grease created by wok style cooking*

### Grease Buildup on Fire-Extinguishing Systems

One of the primary causes of fire-extinguishing system malfunction is grease buildup. Even if the fire-extinguishing system is installed correctly, it will not function properly if there is sufficient grease buildup. These systems must function under severe circumstances. The following pictures are examples of the grease load that these systems can accumulate if not properly maintained. The kitchen staff must keep an eye on the grease buildup on the fire-extinguishing system; if it is impacted the service company needs to be called.



*Grease has completely encased the detection and distribution components. Additionally, this system is improperly installed. The nozzle location will interfere with the ability of the fusible link to detect heat rise.*



*A comparison of block of grease on left to what is under the grease on right. This was the duct protection above a charbroiler. This picture was taken just after the fire-extinguishing system was allegedly serviced.*



*A completely impacted extinguishing system in the plenum of an oriental kitchen. Courtesy of Bryan's Exhaust Cleaning.*

## How Kitchen Fires Can Start/Spread

In order for grease buildup to be ignited within exhaust systems, the accumulated grease needs to be transformed to a gaseous or vapor state. When these vapors are present in sufficient quantity, they form a combustible mixture. For the vapors to reach autoignition temperature<sup>9</sup>, the heat source must have sufficient temperature and heat energy to be transferred to the fuel.

In a generalized scenario, some abnormal event will take place on a cooking surface (where excessive heat and flames are present) to create a flare-up. The most common source of a flare-up is the ignition of cooking oil vapors that come in contact with flames or excess heat. This flare-up produces high reaching flames that contact and/or quickly heat the hood and filters. If the flare-up is intense enough or sustained over a sufficient period of time (approximately 2 minutes<sup>10</sup>) the flame impingement can ignite residual grease accumulations commonly found in the hood/duct area.

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<sup>9</sup> The lowest temperature at which a combustible material ignites in air without a spark or flame. (NFPA 921, Definitions)

<sup>10</sup> UL 300 test format allows for a 120 second pre-burn before the suppression system activates, imitating real world situations.

Fundamentally, fire spread in a kitchen exhaust system is twofold.

- First the ignition of the grease accumulation within the exhaust system because of the availability of combustible grease
- Second the ignition of combustible materials (generally wood building materials or cardboard storage containers) that are too close to the radiant heat energy being emitted from the metal exhaust duct

In the first case, oxygen (oxidant) in the exhaust system is always present. When the heat from a flare-up (high temperature) on the appliances below (source of ignition) sufficiently heats the combustible grease residues within the exhaust system to the point of evaporation ignition will take place (point of ignition).



A duct grease fire will react to a number of variables that will affect the fire's intensity and sustainability. High air velocity from the exhaust fan can either feed the fire or literally "blow the fire out." The consistency (carbon/oil content/moisture) and volume of grease residues will vary; lack of continued flame impingement from the original fire on the appliance will deny the grease fire sufficient energy to maintain sustainability.

If the three components of the fire triangle<sup>11</sup> are present, the fire will continue and in most cases intensify because of the abundance of fuel (grease) that is above the fire within the duct and the energy of the fan and thermal plume of the fire naturally pulling it up toward the roof.

See the *Fire Science Chapter* for a more in-depth understanding of the properties of fire.

As this initial duct fire continues toward the fan, the metal of the duct will become heated. This heat will radiate into the combustible wood and other structures of the building. It is not unusual for secondary fires to start in the combustible materials in close proximity of the duct.

There are numerous variables that will affect the timing, intensity and spread of the secondary fire.

### Where Fires Start

In normal commercial cooking operations, the exhaust fan draws room air cooking appliance combustion effluent and cooking appliances produced grease laden-vapors through the filters and into the hood and duct. This grease vapor condenses with the resultant residue deposits being deposited on the exposed surfaces throughout the system. An appliance malfunction or human error creates sustained flare-ups. The impinging heat (flames) can have sufficient energy to ignite the grease residues on the filters and hood.

Once ignition takes place, several factors will determine whether combustion continues. Fuel and oxygen are usually the key factors. If there is sufficient fuel, air movement provided by the fan will supply all the oxygen necessary. Therefore, it is the abundance of fuel (grease) that most often increases the severity of a fire and creates the radiant heat that may ignite building structures.



<sup>11</sup> For our purposes the common fire triangle is adequate. This author agrees with Vytenis Babrauskas where he states: "The present author does not think it is a useful idea to teach the fire tetrahedron." Note on page 7, Babrauskas, V., *Ignition Handbook*, Fire Science Publishers/Society of Fire Protection Engineers, Issaquah WA (2003).

# A Guide for Commercial Kitchen Fires

**Table 1: Structure Fires in Eating and Drinking Establishments By Area of Origin  
2004-2008 Annual Average**

	Fires	Property Damage (in Millions)
Kitchen or cooking area	4,520	\$67
Confined chimney or flue fire	260	\$1
Exterior roof surface	250	\$3
Exterior wall surface	250	\$6
Lavatory, locker room or cloakroom	240	\$3
Unclassified outside area	180	\$3
Unclassified equipment or service area	180	\$5
Attic or ceiling/roof assembly or concealed space	150	\$16
Wall assembly or concealed space	140	\$5
Heating equipment room	140	\$2
Dining room	130	\$8
Unclassified area of origin	120	\$4
Other known area of origin	1,600	\$105
<b>Total</b>	<b>8,160</b>	<b>\$229</b>

Notes: 1. Unknown-Cause fires Allocated Proportionally.

2. Fires are expressed to the nearest hundred and property damage is rounded to the nearest hundred thousand dollars. Sums may not equal totals due to rounding errors.

Source: National estimates based on NFIRS and NFPA survey. NFPA U.S. Eating and Drinking Establishment Fires, November, 2010.

**Table 2: Structure Fires in Eating and Drinking Establishments by Equipment Involved in Ignition,  
2004-2008 Annual Averages**

Cause	Fires		Property Damage (in Millions)	
Cooking equipment	4,380	54%	\$86	38%
Deep fryer	1,950		\$28	
Range with or without oven, cooking surface	840		\$28	
Grill, hibachi, barbeque	520		\$4	
Oven, rotisserie	350		\$5	
Portable cooking or warming unit	270		\$10	
Grease hood or duct	140		\$9	
Steam table, warming drawer/table	60		\$2	
Unclassified or unknown equipment	240		\$0	
No equipment involved	1,100		\$60	
Heating equipment	830	10%	\$20	9%
Electrical distribution or lighting equipment	620	8%	\$30	13%
Contained trash or rubbish fire	460	6%	\$0	0%
Other equipment	530	7%	\$22	11%
Other non-confined fire	210	3%	\$10	5%
Other confined fire	30	0%	\$0	0%
<b>Total</b>	<b>8,160</b>	<b>100.0%</b>	<b>\$229</b>	<b>100.0%</b>

Notes: 1. Unknown-Cause fires Allocated Proportionally.

2. Fires are expressed to the nearest hundred and property damage is rounded to the nearest hundred thousand dollars. Sums may not equal totals due to rounding errors.

3. Confined fires include confined cooking fires, confined chimney or flue fires, confined trash fires, confined fuel burner or boiler fires, confined commercial compactor fires, and confined incinerator fires. Losses are generally minimal in these fires, which by definition, are assumed to have been limited to the object of origin. Although causal data is not required for these fires, it is sometimes present.



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# FP202(4)-18

Proponents: Linda Hale (Linda.Hale@Loudoun.gov)

## 2018 International Fire Code

Add new text as follows:

202 Cooking Tent Definition Cooking Tent. A structure, enclosure or shelter, with or with-out sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects and which contains cooking equipment that utilize open flames or produce smoke or grease laden vapors for the purpose of preparing and serving food to the public.

**Reason Statement:** Section 3104.15.5 cooking tents requires no less than 20 feet of separation to be provided from a cooking tent to other tents or membrane structures. This section does refer to "cooking" in the definition, but there is no definition or specifics of what this might entail. This has created conflicts with the health department's requirement to have any "cooking" surface covered from the sky. And what the specifics of cooking entails. The definition of cooking is to "to prepare (food) for eating by applying heat." By this technical definition a sterno can on a steam table is cooking as it applies heat to keep the water bath warm. I do not believe that was the intended rational for separating a "cooking tent". This definition is need to assure there is a clear understanding of what "cooking" specifically is for a tent that drives the separation.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
So long as individuals have been requiring the separation that was previously required.

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency

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## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Approval

Workgroup 2 - Final Reason:

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## Public Comments for: FP202(4)-18

This proposal doesn't have any public comments.

Proposal # 400

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# FP319.1.1-18

Proponents: Linda Hale (Linda.Hale@Loudoun.gov)

## 2018 International Fire Code

### 319.1 General

Add new text as follows:

319.1.1 Wheel Chocks Wheel Chocks shall be used to prevent mobile food preparation vehicles from moving.

319.1.2 Separation Mobile food preparation vehicles shall be separated from buildings or structures, combustible materials, vehicles, and other cooking operations by a minimum of 10 ft. (3m).

**Reason Statement:** Mobile Food Preparation Vehicles have become a common commodity for venues seeking to serve hot food either inside or outside. But which do not desire to install a commercial kitchen in compliance with the USBC or a restaurant as defined in Section 35.1-1 of the Code of Virginia and licensed as such by the Board of Health. These vehicles typically use LPG or solid fuel to heat and cook the food. As such they should minimally maintain the same separation distance as any open flame cooking device such as a charcoal burner or LPG grill from buildings or other combustible construction. We have found non-road worthy MFPV located on unprotected loading docks set up against the structure and under the loading dock canopy, attached to buildings, or daisy chained together. These are hazards that the building was not designed to withstand, and create an increased hazard to the occupants

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

**Resiliency Impact Statement:** This proposal will increase Resiliency

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## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Approval

Workgroup 2 - Final Reason:

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## Public Comments for: FP319.1.1-18

This proposal doesn't have any public comments.

Proposal # 405

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# FP319.2.1-18

Proponents: Linda Hale (Linda.Hale@Loudoun.gov)

## 2015 Virginia Statewide Prevention Fire Code

### 319.2 Permit required

Add new text as follows:

319.2.1 Permit Authority Having Jurisdiction (AHJ). The enforcing agent of a permit requirement on a mobile food preparation vehicle (MFPV) shall be the appointed fire official for the Virginia local government which the food truck is identified for personal property tax payment of the vehicle. If no such entity exists, if the local government has elected to not enforce this section of the SFPC, or if the MFPV is housed out of state, then it shall be the State Fire Marshal's Office (SFMO) or designee.

**Reason Statement:** A locality in which the food truck is identified for personal property tax payment is the only jurisdiction that may require a permit. There must be some guidance on who may require a permit for a mobile food preparation vehicle. This does not stop a locality or the SFMO from conducting a life safety inspection when a MFPV is parked with the intention of operating or is operating within their jurisdiction. But a food vendor should not be forced to drive 4 hours to an AHJ so that they may conduct an inspection and garner a permit so that the vendor may return later for a venue in which they are participating. The locality is welcome to conduct an inspection on the day of the venue but not require a permit, fee and forced road trip

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

**Resiliency Impact Statement:** This proposal will increase Resiliency

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## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Approval

Workgroup 2 - Final Reason:

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## Public Comments for: FP319.2.1-18

This proposal doesn't have any public comments.

Proposal # 403

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# **FP405.2-18**

**Proponents:** Andrew Milliken (amiliken@staffordcountyva.gov)

## **2015 Virginia Statewide Prevention Fire Code**

**Revise as follows:**

**TABLE 405.2  
FIRE AND EVACUATION DRILL FREQUENCY AND PARTICIPATION**

<b>GROUP OR OCCUPANCY</b>	<b>FREQUENCY</b>	<b>PARTICIPATION</b>
Group A	Quarterly	Employees
Group B <sup>b</sup>	Annually	All occupants
Group B <sup>b, c</sup> (Ambulatory care facilities)	Annually	Employees
Group B <sup>b</sup> (Clinic, outpatient)	Annually	Employees
Group E	Monthly <sup>a</sup>	All occupants
Group F	Annually	Employees
Group I-1	Semiannually on each shift <sup>a</sup>	All occupants
Group I-2	Quarterly on each shift <sup>a</sup>	Employees
Group I-3	Quarterly on each shift <sup>a</sup>	Employees
Group I-4	Monthly on each shift <sup>a</sup>	All occupants
Group R-1	Quarterly on each shift	Employees
Group R-2 <sup>d</sup>	Four annually	All occupants
Group R-4	Semiannually on each shift <sup>a</sup>	All occupants
SRCF	Monthly	All occupants

- a. In severe climates, the *fire code official* shall have the authority to modify the emergency evacuation drill frequency.
- b. Emergency evacuation drills are required in Group B buildings having an *occupant load* of 500 or more persons or more than 100 persons above or below the lowest *level of exit discharge*.
- c. Emergency evacuation drills are required in ambulatory care facilities in accordance with Section 403.3.
- d. Emergency evacuation drills in Group R-2 college and university buildings shall be in accordance with Section 403.10.2.1. Emergency evacuation drills are required in Group R-2 occupancies that are designed or developed and marketed to senior citizens 55 years of age or older in accordance with 42 U.S. Code, Section 3607(b)(2).

Other Group R-2 occupancies do not require routine emergency evacuation drills but shall be in accordance with Section 403.10.2.2.

**Reason Statement:** The 2015 IFC (and therefore the 2015 VSFPC) brought in a new requirement that mandates evacuation drills for all R-2 occupancies 4 times annually. The code and commentary are not clear if this was intended to apply so broadly however when reading it as currently written, the 2018 IFC would do the same. This proposal does two things. First, it looks to clear up the confusion about which R-2 occupancies require evacuation drills 4 times per year. It also intends to highlight and start to address an increasing population risk in our communities by focusing attention on the ability of occupants to physically evacuate during an emergency. By requiring these evacuation drills for a building where the majority of residents are 55 years of age or older, ambulatory ability concerns can be identified prior to an actual emergency incident. According to the National Fire Protection Association, at age 65 or older, people are twice as likely to be killed or injured by fires compared to the population at large. In fact they indicate that over half of all fire deaths in residential buildings from 2011-2015 were those who are 55 years of age or older. This proposal is intended to correct the recent confusion about broadly required R-2 occupancy evacuation drills as well as focus the requirement on an increasing hazard area within our communities.

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

## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

## Public Comments for: FP405.2-18

This proposal doesn't have any public comments.

Proposal # 377

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# FP407.2-18

Proponents: Aaron Engi

## 2015 Virginia Statewide Prevention Fire Code

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

**Reason Statement:** OSHA accepted electronic MSDS programs as early as July 1989 when fax-on-demand programs were just beginning. 30 years later, as technology has improved, it's now faster and safer for someone to receive an SDS (or database of SDSs) over email or a smartphone app or speaking with a knowledgeable person over a phone than it is to send somebody into a building to retrieve a paper copy from a binder. Some companies manage such programs internally, but others use time-tested 3rd party providers such as ChemTel, Infotrac, Verisk 3E, or KHA to name a few.

Electronic versions can also be updated near instantaneously as changes in products and inventories are made, while paper copies have to be pulled, new ones printed, and then reinserted into the binder. This ease of use not only helps electronic users be compliant, but also helps ensure first responders have a faster, more accurate, and up to date SDS list to review in hazardous times.

Allowing for both paper and electronic SDS programs inherently, rather than electronic programs only when *approved* by Authorities Having Jurisdiction, will be for the betterment of businesses, communities, and first responders.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction. This change will have no impact on construction cost.

**Resiliency Impact Statement:** This proposal will increase Resiliency. By limiting the time necessary to find and retrieve SDS binders, first responders can use the business' SDS-on-demand program to retrieve applicable SDS information, therefore hastening response time and the safety of responders and the nearby community. This will help to minimize damages and the business/community to recover quicker as a result.

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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## Public Comments for: FP407.2-18

This proposal doesn't have any public comments.

Proposal # 280

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# FP609.2-18

**Proponents:** Andrew Milliken (amilliken@staffordcountyva.gov)

## 2015 Virginia Statewide Prevention Fire Code

**(N) 609.2 ~~Where required. Commercial cooking operations. A Type I hood shall be installed~~ Where ventilation is provided or required by the applicable building code at or above all commercial cooking appliances and domestic cooking appliances used for commercial purposes that produce grease vapors ~~in mobile food preparation vehicles.~~ ventilation shall be operated and maintained. The fire code official is not authorized to require alteration or installation of a ventilation hood in accordance with SFPC Section 102.6.**

**Exception:** A Type I hood shall not be required for an electric cooking appliance where an ~~approved testing agency provides documentation that the appliance effluent contains 5 mg/m<sup>3</sup> or less of grease when tested at an exhaust flow rate of 500 cfm (0.236 m<sup>3</sup>/s) in accordance with UL 710B.~~

**Reason Statement:** This proposal restores a key enforcement tool for ensuring proper ventilation during cooking operations while directing the user to the applicable building code and ultimately the building official for the proper type of ventilation. This proposal provides the bridge between the fire code official and the building code official to effectively manage the single leading cause of fires.

The revision to the proposal uses language recommended by DHCD staff at the latest workgroup session. Further discussion with VBCOA and other stakeholders achieved consensus with this language.

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

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:** Carryover to Sept 2020. Consensus as Amended. Change: to Ventilation where provided or required/

**Workgroup 2 - Proposed Committee Action:** Carry over to Final

**Workgroup 2 - Proposed Reason:** 8/21/19--Proponent and Rick Witt to work together on language.

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## Public Comments for: FP609.2-18

**Discussion by William Andrews**

Aug 22, 2019 14:38 UTC

Suggest add "commercial" to clarify not apply within residences. Expect readers understand intent for inside, not outdoors. 2000 IFC sec. 609.2 read: "A type I hood shall be installed at or above all *commercial food heat-processing appliances* that produce grease vapors or smoke. Exceptions: Food heat-processing appliances installed within a dwelling unit." "Commercial Food Heat-Processing Appliance" was defined as in a food-processing establishment, which noted include any building or a portion thereof used for the processing of food.

Helps fire official citing portable cooking risk which use not approved by building official. Instead of fire official citing vague unsafe condition or use other than as approved by building official, then need refer to or get building official to verify did not approve that type cooking activity there.

Proposal # 116

- No unusual response from typical radiation exposure from adjacent properties to present a risk of ignition of the subject building under reasonably severe fire scenarios.
- No unusual fire department access issues.
- Egress systems designed to protect building occupants during the design escape time, plus a factor of safety.
- Highly reliable fire suppression systems to reduce the risk of failure during reasonably expected fire scenarios. The degree of reliability should be proportional to evacuation time (height) and the risk of collapse.

The comprehensive package of proposals from the TWB meet these performance objectives. The TWB also determined that fire testing was necessary to validate these concepts. At its first meeting, members discussed the nature and intention of fire testing so as to ensure meaningful results for the TWB and, more specifically, for the fire service. Subsequently a test plan was developed. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of joints, and to evaluate conditions for responding fire personnel. The Fire WG then refined the test plan, which was implemented with a series of five, full-scale, multiple-story building tests at the Alcohol, Tobacco and Firearms (ATF) laboratories in Beltsville, MD. The results of those tests, as well as testing conducted by others, helped form the basis upon which the Codes WG developed its code change proposals. These code change proposals are the ones developed and approved by the TWB that were approved for the 2021 code.

To review a summary of the fire tests, please visit:

<http://bit.ly/ATF-firetestreport>

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17

#### Additional Background Information:

The ICC Board approved the establishment of an ad hoc committee for tall wood buildings in December of 2015. The purpose of the ad hoc committee is to explore the science of tall wood buildings and to investigate the feasibility and take action on developing code changes for tall wood buildings. The committee is comprised of a balance of stakeholders with additional opportunities for interested parties to participate in the four Work Groups established by the ad hoc committee, namely: Code; Fire; Standards/Definitions; and Structural. For more information, be sure to visit the ICC website

<https://www.iccsafe.org/codes-tech-support/cs/icc-ad-hoc-committee-on-tall-wood-buildings/>

(link active and up to date as of 12/27/17).

As seen in the “Meeting Minutes and Documents” and “Resource Documents” sections of the committee web page, the ad hoc committee reviewed a substantial amount of information in order to provide technical justification for code proposals.

The ad hoc committee developed proposals for the followings code sections. The committee believes this package of code changes will result in regulations that adequately address the fire and life safety issues of tall mass timber buildings.

In addition, fire tests designed to simulate the three new construction types (Types IVA, IVB and IVC) in the ad hoc committee proposals were conducted at the Alcohol Tobacco and Firearms test lab facility. The TWB was involved in the design of the tests, and many members witnessed the test in person or online. The results of the series of 5 fire tests provide additional support for these proposals and validate the fire performance for each of the types of construction proposed by the committee. The fire tests consisted of one-bedroom apartments on two levels, with both apartments having a corridor leading to a stair. The purpose of the tests was to address the contribution of mass timber to a fire, the performance of connections, the performance of through-penetration fire stops, and to evaluate conditions for responding fire personnel.

To review a summary of the fire tests, please visit

<http://bit.ly/ATF-firetestreport>

To watch summary videos of the fire tests, which are accelerated to run in 3 ½ minutes, please visit:

<http://bit.ly/ATF-firetestvideos>

Both of these links were confirmed active on 12/27/17.

# FP807.5.4-18

**Proponents:** William Hall, Virginia Dept of Corrections (william.hall@vadoc.virginia.gov)

## 2015 Virginia Statewide Prevention Fire Code

**Revise as follows:**

**807.5.4 Group I-3.** In Group I-3, combustible *decorative materials* are prohibited.

### EXCEPTION

Cell areas in buildings equipped throughout with an *automatic sprinkler system* in accordance with the applicable NFPA 13 standard where a maximum 4 sq. ft. area has been demarcated on the wall for personal items 0.025 inch (0.64 mm) or less in thickness applied directly to and adhering to the wall.

**Reason Statement:** We are seeking to make this section more enforceable by permitting a very small amount of personal affects to be attached and adhered to the wall of an offenders cell space when fully protected by a sprinkler system. It is nearly impossible to keep offenders from attaching some type of combustible material to their personal cell walls. The risks associated with permitting a small amount material is greatly reduced by the presence of sprinklers and the placement of the demarcated area (away from other combustibles). The area can be better monitored and the demarcated space by visual inspection quickly insures the limit is not exceeded. We feel this change is warranted by the low occurrence of I-3 fires, 24 hour staff monitoring, presense of sprinkler systems and typically smoke detection within the cell.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
N/A

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency  
N/A

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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## Public Comments for: FP807.5.4-18

This proposal doesn't have any public comments.

Proposal # 278

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# FP2306.2.1-18

Proponents: DHCD Staff

## 2015 Virginia Statewide Prevention Fire Code

Revise as follows:

**2306.2.1 Underground tanks.** Underground tanks for the storage of Class I, II and IIIA liquid fuels shall comply with Chapter 57. For tanks subject to the State Water Control Board Regulations 9VAC25-580, see Section 5701.1.1

**(N) 2306.2.2 Aboveground tanks located inside buildings.** Aboveground tanks for the storage of Classes I, II and IIIA liquid fuels located in buildings shall be *maintained* in accordance with the *applicable building code*. For tanks subject to the State Water Control Board Regulations 9VAC25-91, see Section 5701.1.1

**(N) 2306.2.3 Aboveground tanks located outside above grade.** Aboveground tanks located outside shall be *maintained* in accordance with the *applicable building code*. For tanks subject to the State Water Control Board Regulations 9VAC25-91, see Section 5701.1.1

**(N) 2306.2.4 Aboveground tanks located in abovegrade vaults or below-grade vaults.** Aboveground tanks located in above-grade vaults or below-grade vaults shall be *maintained* in accordance with the *applicable building code*. For tanks subject to the State Water Control Board Regulations 9VAC25-91, see Section 5701.1.1

**3605.1 Fuel dispensing.** Marine motor fuel-dispensing facilities shall be in accordance with Chapter 23. For tanks subject to the State Water Control Board Regulations 9VAC25-91 or 9VAC25-580, see Section 5701.1.1

**(N) 5003.2.4 Installation of tanks.** Installation of tanks shall be in accordance with Sections 5003.2.4.1 through 5003.2.4.2.1. For tanks subject to the State Water Control Board Regulations 9VAC25-91 or 9VAC25-580, see Section 5701.1.1

**5704.1 General.** The storage of flammable and *combustible liquids* in containers and tanks shall be in accordance with this section and the applicable sections of Chapter 50. For tanks subject to the State Water Control Board Regulations 9VAC25-91 or 9VAC25-580, see Section 5701.1.1

**(N) 5704.2.9 Aboveground tanks.** Aboveground storage of flammable and *combustible liquids* in tanks shall be *maintained* in accordance with the *applicable building code*. For tanks subject to the State Water Control Board Regulations 9VAC25-91, see Section 5701.1.1

**(N) 5704.2.11 Underground tanks.** Underground storage of flammable and *combustible liquids* in tanks shall be *maintained* in accordance with the *applicable building code*. For tanks subject to the State Water Control Board Regulations 9VAC25-580, see Section 5701.1.1

**Reason Statement:** Provides pointers for SWCB regulated tanks

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

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency  
This proposal will neither increase nor decrease Resiliency.

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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## Public Comments for: FP2306.2.1-18

This proposal doesn't have any public comments.

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# FP2306.2.1.1-18

Proponents: DHCD Staff (sbco@dhcd.virginia.gov)

## 2015 Virginia Statewide Prevention Fire Code

Revise as follows:

**2306.2.1.1 Inventory ~~control and leak detection records~~ records for underground tanks.** Accurate inventory records shall be *maintained* on underground fuel storage tanks for indication of possible leakage from tanks and piping. The records shall be kept at the premises or made available for inspection by the fire official within 24 hours of a written or verbal request and shall include records for each tank. Where there is more than one system consisting of tanks serving separate pumps or dispensers for a product, the inventory record shall be *maintained* separately for each tank system.

~~Owners and operators of underground fuel storage tanks shall provide release detection for tanks and piping that routinely contain flammable and combustible liquids in accordance with one of the following methods:~~

- ~~1. Monthly inventory control to detect a release of at least 1.0 percent of flow through plus 130 gallons (492 L).~~
- ~~2. Manual tank gauging for tanks with 2,000 gallon (7571 L) capacity or less when measurements are taken at the beginning and ending of a 36-hour to 58-hour period during which no liquid is added to or removed from the tank.~~
- ~~3. Tank tightness testing capable of detecting a 0.1 gallon (0.4 L) per hour leak rate.~~
- ~~4. Automatic tank gauging that tests for loss of liquid.~~
- ~~5. Vapor monitoring for vapors within the soil of the tank field.~~
- ~~6. Groundwater monitoring when the groundwater is never more than 20 feet (6096 mm) from the ground surface.~~
- ~~7. Interstitial monitoring between the underground tank and a secondary barrier immediately around or beneath the tank.~~
- ~~8. Other *approved* methods that have been demonstrated to be as effective in detecting a leak as the methods listed above.~~

A consistent or accidental loss of product shall be immediately reported to the fire official.

Add new text as follows:

**2306.2.1.2 Release detection for State Water Control Board regulated underground tanks** Underground storage tank systems subject to the Virginia State Water Control Board regulation 9VAC25-580 shall comply with the release detection requirements of 9VAC25-580-130.

**Reason Statement:** Initial release detection methods were provided in 2306.2.1.1 to correlate with specific methods listed in the State Water Control Board regulations. In an effort to mitigate differences between the SFPC and the SWCB regs due to the specific requirements in the SWCB changing at different times than the SFPC, it is more prudent to reference the section in the SWCB than the specific requirements themselves.

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

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency  
This proposal will neither increase nor decrease Resiliency.

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## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Approval

Workgroup 2 - Final Reason:

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## Public Comments for: FP2306.2.1.1-18

This proposal doesn't have any public comments.

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# FP2403.2.1.3-18

**Proponents:** Joseph Willis, Prince William County (jwillis@pwcgov.org); Haywood Kines, Prince Wiliam County (hkines@pwcgov.org)

## 2015 Virginia Statewide Prevention Fire Code

**Revise as follows:**

(N) ~~2403.2.1.3~~ **2403.2.1.3 Areas adjacent to spray booths.** Electrical wiring and equipment located outside of, but within ~~5 feet (1524 mm)~~ 3 feet (915mm) horizontally and 3 feet (~~914 mm~~) (915mm) vertically of, openings in a spray booth or a spray room shall be *maintained* in accordance with the *applicable building code*.

**Reason Statement:** The purpose behind this code change is create consistency in defining the classified area outside of a spray booth. NFPA 70, NFPA 33 (Standard for Spray Application Using Flammable or Combustible Materials) and International Fire Code all list this area to be 3 feet horizontally from any opening and 3 feet vertically from any opening. The Virginia Statewide Fire Prevention Code still lists the classified area to be 5 feet horizontally and 3 feet vertically from any opening.

In order to avoid any potential conflicts in enforcement and maintenance provisions, I respectfully request The Virginia Statewide Fire Prevention Code be amended as noted to create consistency amongst the Codes and referenced standards.

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

The consistency amongst the codes to create a 3 feet area around the opening at the spray booth will potentially decrease the cost of construction by creating an equal standard of enforcement and maintenance amongst all the codes. In addition to the obvious cost savings of not having to use specialized electrical equipment and methods in that 3-5 foot range, this amendment will prevent potentially costly delays in construction and potential change orders.

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency

There is no expected change to resiliency to this code change as the 3 foot horizontal dimension has been the standard by NFPA 70 since at least 1978.

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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## Public Comments for: FP2403.2.1.3-18

**Discussion by Haywood Kines**

Jan 31, 2020 20:58 UTC

This proposal will help with consistency of code enforcement for both installation and maintenance. This recommended code change will also prevent costly changes to equipment to comply with a maintenance code after the equipment is installed and approved under the Va. Construction Code.

Proposal # 323

## NFPA Codes and Standards

### 2018 NFPA 33 Spray Application Using Flammable or Combustible Materials

#### Section 6.5.4

If spray application operations are confined to an enclosed spray booth or room, electrical area classification shall be as follows:

- (1) The areas within 915 mm (3 ft) of any opening shall be classified as Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable.

### 2017 NFPA 70 Article 516 Spray Application Dipping, Coating, and Printing Processes

#### Section 516.3 (D)(4)

For spray applications operations confined to an enclosed spray booth or room, electrical area classification shall be as follows:

- (1) The area within 915 mm (3 ft) of any opening shall be classified as Class I, Division 2; Class I, Zone 2; Class II, Division 2; or Zone 22 locations, whichever is applicable.

# FP3107.12.5-18

Proponents: Linda Hale (Linda.Hale@Loudoun.gov)

## 2018 International Fire Code

### CHAPTER 31 TENTS, TEMPORARY SPECIAL EVENT STRUCTURES AND OTHER MEMBRANE STRUCTURES SECTION 3107 OPERATIONAL REQUIREMENTS

**Revise as follows:**

**3107.12.5 Cooking tents.** ~~Cooking Tents with sidewalls or drops where cooking is performed~~ shall be separated from other tents or membrane structures by not less than 20 feet (6096 mm).

**Reason Statement:** This separation requirement is consistent with the overall requirement covering open or exposed flames. The inclusion of sides and drops does increase the speed and degree of accumulation of grease from cooking operations that create smoke and/or grease laden vapors, but a simple canopy also collects these flammable substances posing a fire risk to adjoining assembly tents.

This is no different than a pavilion built over a smoke that the USBC would prohibit for the same rationale for fire risk. The 20-foot (6096 mm) separation provides protection from hot embers from a fire reaching the main membrane structure.

The requirements for keeping the open area free of combustible materials or debris that could limit access to emergency response personnel also apply

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
no cost

**Resiliency Impact Statement:** This proposal will increase Resiliency  
prevent fires from extending to an assembly tent with occupants and materials

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:** Carryover to Sept

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## Public Comments for: FP3107.12.5-18

**Discussion by Andrew Smith**

Aug 10, 2020 14:15 UTC

We are concerned with this proposal as it would then include in the definition of a "cooking tent" those tents or canopies with no sides, which many used as a temporary cover for protection of the food being prepared or heated, and for shade and protection from the weather conditions for the person or staffer working the space. Many of these sideless tents/canopies are only used for the day at such places as Farmers Markets or agritourism events where people have to rent a space/booth for each cover used. Requiring a separate "structure" 20 ft. away for cooking/heating would not allow them to participate in numerous markets or events due to doubling their expenses for the tent and for the space rented. We appreciate the intent for safety but feel having on-hand precautions like fire extinguishers should be sufficient in these temporary cases where canopy-type tents are used. For these reasons, Virginia Farm Bureau Federation is opposed to this proposal.

Andrew Smith, Associate Director, Governmental Relations – Virginia Farm Bureau Federation

This proposal doesn't have any public comments.

Proposal # 480

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# FP5703.1.2-18

Proponents: DHCD Staff

## 2015 Virginia Statewide Prevention Fire Code

Revise as follows:

(N) ~~5702.1.2~~ 5703.1.2 **Classified locations for combustible liquids.** Areas where Class II or III liquids are heated above their flash points shall be *maintained* in accordance with the *applicable building code*.

**Reason Statement:** This proposal is an editorial correction to a section number typo.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
This is an editorial correction that does not impact construction cost.

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency  
This is an editorial correction that does not impact resiliency.

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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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## Public Comments for: FP5703.1.2-18

This proposal doesn't have any public comments.

Proposal # 432

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# FP5704.2.13.1.1-18

Proponents: DHCD Staff

## 2015 Virginia Statewide Prevention Fire Code

Revise as follows:

**5704.2.13.1.1 Temporarily out of service.** Underground tanks temporarily out of service shall have the fill line, gauge opening, vapor return and pump connection secure against tampering. Vent lines shall remain open and be maintained in accordance with Sections 5704.2.7.3 and 5704.2.7.4.

Exception: Underground storage tank systems subject to the Virginia State Water Control Board regulation 9VAC25-580 that are out-of-service shall comply with the temporary closure requirements of 9VAC25-580-310.

**5704.2.13.1.3 Out of service for one year.** Underground tanks that have been out of service for a period of one year shall be removed from the ground in accordance with Section 5704.2.14 or abandoned in place in accordance with Section 5704.2.13.1.4.

Exception: Underground storage tanks tank systems subject to the Virginia State Water Control Board regulation 9VAC25-580 that are in compliance with the performance standards of 9VAC25-580-50 and 9VAC25-580-60 are allowed to remain temporarily closed for a period of more than one year in accordance with 9VAC25-580-310 as part of the Virginia Department of Environmental Quality's program.

**Reason Statement:** Makes reference to the SWCB regulation section since there are some specific requirements that are different from the requirements in this section.

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

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency  
This proposal will neither increase nor decrease Resiliency.

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## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Approval

Workgroup 2 - Final Reason:

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## Public Comments for: FP5704.2.13.1.1-18

This proposal doesn't have any public comments.

Proposal # 425

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## FP103.2.1 (VFSB SFPC Edit Part 2)-18

**Proponents:** Andrew Milliken (amiliken@staffordcountyva.gov); SFPC Edit Workgroup

**Reason Statement:** This proposal includes items that were reviewed and decided on by the SFPC Edit Workgroup at their 08/14/19, 11/12/19 and 1/15/20 SWG meetings

Proposal approved by Workgroup 2 on 7/1/20

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### Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Approval

**Workgroup 2 - Final Reason:**

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See attached for specific proposals

	C	E	F	G
	WG REC	WG AMENDMENTS/MODIFICATIONS	VFSB PROPOSAL	VFSB REASON/COMMENTS
1		2306.2.6 Special enclosures. Special enclosures, including concrete vaults, shall be maintained and remain in accordance with the applicable building code. Tanks for liquid motor fuels are allowed to be operated in approved special enclosures where maintained in accordance with the following: 1.The special enclosure shall be maintained liquid tight and vapor tight. 2.The special enclosure shall not contain backfill. 3.Sides, top and bottom of the special enclosure shall be maintained as reinforced concrete, with openings for inspection through the top only. 4.Tank connections shall be maintained as piped or closed such that neither vapors nor liquid can escape into the enclosed space between the special enclosure and any tanks inside the special enclosure. 5.Means shall be maintained whereby portable equipment can be employed to discharge to the outside any vapors which might accumulate inside the special enclosure should leakage occur. 6.The individual and aggregate capacity of tanks containing Class 1, II or IIIA liquids operated inside a special enclosure shall maintain as approved in accordance with the applicable building code. 7.Unless otherwise approved, each tank within special enclosures shall maintain a clear space of not less than 3 feet (910 mm) to allow for maintenance and inspection.	2306.2.6 Special enclosures. Special enclosures (essentially concrete vaults) shall be maintained and remain in accordance with the applicable building code. Tanks for liquid motor fuels are allowed to be operated in approved special enclosures where maintained in accordance with the following: 1.The special enclosure shall be maintained liquid tight and vapor tight. 2.The special enclosure shall not contain backfill. 3.Sides, top and bottom of the special enclosure shall be maintained as reinforced concrete, with openings for inspection through the top only. 4.Tank connections shall be maintained as piped or closed such that neither vapors nor liquid can escape into the enclosed space between the special enclosure and any tanks inside the special enclosure. 5.Means shall be maintained whereby portable equipment can be employed to discharge to the outside any vapors which might accumulate inside the special enclosure should leakage occur. 6.Tanks containing Class 1, II or IIIA liquids operated inside a special enclosure shall maintain not more than 6,000 gallons (22 710 L) in individual capacity or 18,000 gallons (68 130 L) in aggregate capacity unless otherwise approved by the applicable building code. 7.Unless otherwise approved, each tank within special enclosures shall maintain a clear space of not less than 3 feet (910 mm) to allow for maintenance and inspection.	The safe operation within special enclosures is dependent upon maintaining the items listed in this section. There are no maintenance requirements in the building code. Also, language from the commentary as to the concept/definition of special enclosures has been provided for clarity.
378	CAAM			
484	CA		2311.8.4 Motor vehicle repair booths The maintenance and operation of motor vehicle repair booths shall be in accordance with Sections 2311.8.4.1 through 2311.8.4.4.	NEW
563	CA	2703.1.3 Signals. Unless otherwise permitted by the applicable building code, the emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems include, but are not limited to, the following where such equipment or systems are required by the applicable building code: 1. Automatic sprinkler system alarm and monitoring systems. 2. Manual fire alarm systems. 3. Emergency alarm systems. 4. Continuous gas detection systems. 5. Smoke detection systems. 6. Emergency power system. 7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required 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 2704.2.3.4.	2703.1.3 Signals. Unless otherwise required in accordance with the applicable building code, the emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detection systems include, but are not limited to, the following where such equipment or systems are required by the applicable building code: 1. Automatic sprinkler system alarm and monitoring systems. 2. Manual fire alarm systems. 3. Emergency alarm systems. 4. Continuous gas detection systems. 5. Smoke detection systems. 6. Emergency power system. 7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required 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 2704.2.3.4.	Restores language that is more consistent with the IFC but not vastly different from the 2015 VSFPFC. Semiconductor facilities are unique facilities that, due to their size, complex layout and the logistics of their operations, have been provided with a unique package of requirements. Requirements for Semiconductor Fabrication Facilities first appeared in the 1987 BOCA Fire Prevention Code. An Emergency Control Station was defined as "An approved location on the premises of an HPM use facility, where signals for emergency equipment are received. Gas detection systems were specifically required to be connected to the emergency control station. The 2000 IBC required systems 1 through 6 to send signals to the Emergency Control Station. The requirements for systems 7 and 8 dealing with pyrophoric and water-reactive liquids first appeared in the 2006 Fire Code. This section specifies the systems that are to be monitored by an emergency control station. The fire alarm system signals are received at the emergency control station, which must remain located in an area approved by the fire code official.
570	CAAM		2703.2.2 General requirements. In addition to the requirements in Section 2703.2, systems, equipment and other processes shall also comply with Section 5003.2, other applicable provisions of this code and the applicable building code.	Adds the term "applicable building code" in place of IBC and IMC. This term was NOT provided by the 2015 VSFPFC.
571	CA		2703.3.2 Pass-through in exit access corridors. Pass-through in exit access corridors shall comply with the applicable building code.	Replaced the word "be" with "comply" for consistency.
573	CA		2703.3.3 Liquid storage rooms. Liquid storage rooms shall comply with Chapter 57 and the applicable building code.	Restores reference to maintenance requirements of Chapter 57
574	CA		2703.3.4 HPM rooms. HPM rooms shall comply with the applicable building code.	Replaced the word "be" with "comply" for consistency.
575	CA		2703.3.5 Gas cabinets. Gas cabinets shall comply with Section 5003.8.6.	There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.6.
576	CA		2703.3.6 Exhausted enclosures. Exhausted enclosures shall be maintained in accordance with Section 5003.8.5 and remain in accordance with the applicable building code.	There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.5.
577	CA		2703.3.7 Gas rooms. Gas rooms shall be maintained in accordance with Section 5003.8.4 and remain in accordance with the applicable building code.	There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.4.
578	CA		2703.3.8 Service corridors. Service corridors shall comply with Section 2705.3 and the remain in accordance with the applicable building code.	There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 2705.3.
579	CA		2703.7 Electrical wiring and equipment. Electrical wiring and equipment in HPM facilities shall comply with Sections 2703.7.1 through 2703.7.3.	Restores scoping language for the following subsections.
580	CAAM	2703.7.1 Fabrication areas. Electrical wiring and equipment in fabrication areas shall be maintained in accordance with NFPA 70 and remain in accordance with the applicable building code.	2703.7.1 Fabrication areas. Electrical wiring and equipment in fabrication areas shall be maintained in accordance with NFPA 70 and remain in accordance with the applicable building code.	Restores reference to maintenance requirements of NFPA 70.
581	CAAM	2703.7.2 Workstations. Electrical equipment and devices within 5 feet (1524 mm) of workstations in which flammable or pyrophoric gases or flammable liquids are used shall be maintained in accordance with the applicable provisions of NFPA 70 for hazardous locations. Workstations shall not be energized without adequate exhaust ventilation in accordance with Section 2703.14. Exception: Not required when the air removal from the workstation or dilution will prevent the accumulation of flammable vapors and fumes on a continuous basis.	2703.7.2 Workstations. Electrical equipment and devices within 5 feet (1524 mm) of workstations in which flammable or pyrophoric gases or flammable liquids are used shall be maintained in accordance with NFPA 70 for hazardous locations. Workstations shall not be energized without adequate exhaust ventilation in accordance with Section 2703.14. Exception: Not required when the air removal from the workstation or dilution will prevent the accumulation of flammable vapors and fumes on a continuous basis.	Workstations are commonly relocated and arrangements changed so it is important to have this technical information for proper classification of areas. Areas located in and around workstations are considered Class 1, Division 2, hazardous locations as defined by Article 500 of NFPA 70. Incidental exposures to flammable fumes or vapors must be considered horizontally possible within 5 feet (1524 mm) of each workstation where flammable liquids or gases are used. Either a mechanical or electrical interlock must be installed to engage the required exhaust ventilation system before HPM enters the workstation. This reduces the likelihood of gas or vapor exposure.  The exception in this section states that, in some cases, it is both possible and reasonable to assume that a hazardous concentration of flammable gas or vapor is unlikely to occur when ventilation is properly engaged. Class 1, Division 2, electrical wiring and equipment is not required where automatic exhaust interlocks are installed.
582	CAAM	2703.7.3 Hazardous production material (HPM) rooms, gas rooms and liquid storage rooms. Electrical wiring and equipment in HPM rooms, gas rooms and liquid storage rooms shall be maintained in accordance with the applicable provisions of NFPA 70 and remain in accordance with the applicable building code.	2703.7.3 Hazardous production material (HPM) rooms, gas rooms and liquid storage rooms. Electrical wiring and equipment in HPM rooms, gas rooms and liquid storage rooms shall be maintained in accordance with NFPA 70 and remain in accordance with the applicable building code.	Electrical wiring, equipment and devices in HPM cutoff rooms used for the storage of flammable liquids or gases must be classified for hazardous locations, in accordance with NFPA 70. The hazardous location requirements in NFPA 70 contain special protection features to preclude ignition of flammable vapors, liquids, gases or dusts by sparks or electrical arcing.
583	CAAM	2703.10 Automatic sprinkler system. Where required by the applicable building code automatic sprinkler systems shall be maintained in accordance with Chapter 9.	2703.10 Automatic sprinkler system. An approved automatic sprinkler system shall be maintained in accordance with Chapter 9, this section and remain in accordance with the applicable building code.	Restores the reference to Chapter 9 for maintenance of fire protection systems.
584	CAAM	2703.10.5 Sprinkler alarms and supervision. Automatic sprinkler systems, associated electronic supervision and alarms shall be maintained in accordance with Chapter 9. Where provided, automatic sprinkler system alarm and supervisory signals shall also remain transmitted to the emergency control station.	2703.10.5 Sprinkler alarms and supervision. Automatic sprinkler systems, associated electronic supervision and alarms shall be maintained in accordance with Chapter 9. Where provided, automatic sprinkler system alarm and supervisory signals shall also remain transmitted to the emergency control station in accordance with the applicable building code.	Restores the reference to supervising sprinkler system alarms at the emergency control station if required by the applicable building code. Automatic sprinkler system alarm and supervisory signals should be transmitted to the on-site emergency control station.
585	CAAM	2703.11 Manual fire alarm system. Where provided, a manual fire alarm system shall be maintained in accordance with Chapter 9 and remain throughout buildings containing a Group H-5 occupancy in accordance with the applicable building code. Where provided, activation of the alarm system shall also be maintained to transmit a signal to the emergency control station.	2703.11 Manual fire alarm system. Where provided, a manual fire alarm system shall be maintained in accordance with Chapter 9 and remain throughout buildings containing a Group H-5 occupancy in accordance with the applicable building code. Where provided, activation of the alarm system shall also be maintained to transmit a signal to the emergency control station.	Provides technical requirements and expectations for manual fire alarm systems in these facilities. A manual fire alarm system activation is to set off a local alarm, with the alarm signal transmitted to the on-site emergency control station. Note that the local alarm signal is intended only for the area of alarm origin and is not intended to be a general alarm that sounds throughout the building.
586	CAAM	2703.12 Emergency alarm system. Emergency alarm systems shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code. Where required by the applicable building code, emergency alarm systems shall also remain transmitted to the emergency control station.	2703.12 Emergency alarm system. Emergency alarm systems shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code. Where provided, emergency alarm systems shall also remain transmitted to the emergency control station in accordance with the applicable building code.	Restores the reference to Chapter 9 for maintenance of emergency alarm systems. This section requires an operational emergency alarm system in all areas where HPM is transported or stored and to transmit to the emergency control station.
587	CA	Delete	2703.12.1.2 Corridors and interior exit stairways and ramps. (delete)	Construction requirements.
588	CA	Delete	2703.12.1.3 Liquid storage rooms, HPM rooms and gas rooms. (delete)	Construction requirements.
589	CAAM	2703.13 Continuous gas detection systems. Where required by the applicable building code, a continuous gas detection system shall be maintained for HPM gases. Such a system shall remain in accordance with the applicable building code 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.	2703.13 Continuous gas detection systems. Where provided, a continuous gas detection system shall be maintained for HPM gases. Such a system shall remain in accordance with the applicable building code 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.	Restores reference to critical thresholds to be used for detection maintenance. A gas detection system in the room or area used for the storage or use of HPM gases provides early notification of a leak before the escaping gas reaches hazardous concentration levels.
590	CAAM	2703.13.2 Gas detection system operation. Where required by the applicable building code, a continuous gas detection system shall be maintained capable of monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations: 1.Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet. 2.Permissible exposure limit (PEL) levels when 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) when 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.	2703.13.2 Gas detection system operation. In accordance with the applicable building code, a continuous gas detection system shall be maintained capable of monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations: 1.Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet. 2.Permissible exposure limit (PEL) levels when 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) when 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.	This section identifies the operational requirements for an effective gas detection system. This section harmonizes the code with the widely used clean-room standard NFPA 318 provisions for gas detection, which are much more relevant to the type of monitoring performed in semiconductor manufacturing (inside exhausted enclosures, ventilated enclosures or gas cabinets). Monitoring in the semiconductor industry is designed to detect and alert employees of leaks inside exhausted enclosures, ventilated enclosures and gas cabinets, and is not intended to estimate potential employee breathing zone exposures.  This section requires gas detection based on the potential for health-threatening levels both inside enclosures and in the employee environment as established by nationally accepted health standards, such as those used by the Occupational Safety and Health Administration (OSHA). The permissible exposure limit (PEL) of a gas is the legal limitation for long-term exposure (8 to 10 hours, normally). The American Conference of Governmental Industrial Hygienists (ACGIH) publishes threshold limit values (TLVs) based on a time-weighted average. State and local laws may also contain limits.  Additionally, flammable gas detection must be installed where dispensing that may result in vapor concentrations in excess of 25 percent of the lower explosive limit (LEL) occurs, as is consistent with the applicable building codes and NFPA 318. LELs can be obtained from suppliers or other printed sources, such as the NFPA Fire Protection Guide to Hazardous Materials. Chapter 60 contains additional requirements for monitoring highly toxic and toxic compressed gases.
591	CA		2703.14 Exhaust ventilation systems for HPM. Exhaust ventilation systems and materials for exhaust ducts utilized for the exhaust of HPM shall be maintained and operated in accordance with this chapter, other applicable provisions of this code, and remain in accordance with the applicable building code.	Restores the operational requirement for ventilation systems as well as reference to subsections below.

	C	E	F	G
592	CAAM	2703.14.1 Operations and Maintenance of HPM areas. Exhaust ventilation systems shall be maintained in the following locations in accordance with the requirements of this section and the applicable building code: 1. Fabrication areas: Exhaust ventilation for fabrication areas shall comply with the applicable building code. 2. Workstations: A ventilation system shall be maintained to capture and exhaust gases, fumes and vapors at workstations. 3. Liquid storage rooms: Exhaust ventilation for liquid storage rooms shall comply with Section 5004.3.1 and the applicable building code. 4. HPM rooms: Exhaust ventilation for HPM rooms shall comply with Section 5004.3.1 and the applicable building code. 5. Gas cabinets: Exhaust ventilation for gas cabinets shall comply with Section 5003.8.6.2. The gas cabinet ventilation system is allowed to connect to a workstation ventilation system. Exhaust ventilation for gas cabinets containing highly toxic or toxic gases shall also comply with Chapter 60. 6. Exhausted enclosures: Exhausted enclosures shall comply with Section 5003.8.5.2. Exhaust ventilation for exhausted enclosures containing highly toxic or toxic gases shall also comply with Chapter 60. 7. Gas rooms: Exhaust ventilation for gas rooms shall comply with Section 5003.8.4.2 and the applicable building code. Exhaust ventilation for gas rooms containing highly toxic or toxic gases shall also comply with Chapter 60. 8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids: Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids shall be as required in Section 2705.2.3.4.	2703.14.1 Operations and Maintenance of HPM areas. Exhaust ventilation systems shall be maintained in the following locations in accordance with the requirements of this section and remain in accordance with the applicable building code: 1. Fabrication areas: Exhaust ventilation for fabrication areas shall comply with the applicable building code. 2. Workstations: A ventilation system shall be maintained to capture and exhaust gases, fumes and vapors at workstations. 3. Liquid storage rooms: Exhaust ventilation for liquid storage rooms shall comply with Section 5004.3.1 and the applicable building code. 4. HPM rooms: Exhaust ventilation for HPM rooms shall comply with Section 5004.3.1 and the applicable building code. 5. Gas cabinets: Exhaust ventilation for gas cabinets shall comply with Section 5003.8.6.2. The gas cabinet ventilation system is allowed to connect to a workstation ventilation system. Exhaust ventilation for gas cabinets containing highly toxic or toxic gases shall also comply with Chapter 60. 6. Exhausted enclosures: Exhaust ventilation for exhausted enclosures shall comply with Section 5003.8.5.2. Exhaust ventilation for exhausted enclosures containing highly toxic or toxic gases shall also comply with Chapter 60. 7. Gas rooms: Exhaust ventilation for gas rooms shall comply with Section 5003.8.4.2. Exhaust ventilation for gas rooms containing highly toxic or toxic gases shall also comply with Chapter 60. 8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids: Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids shall be as required in Section 2705.2.3.4.	Restored the references to the maintenance requirements of Chapter 50. This technology was not introduced into Virginia until the 1990s when the BOCA codes provided requirements for these facilities. These are core requirements of HPM facilities.
593	CAAM	2703.15 Emergency power system. Where required by the applicable building code, an emergency power system shall be maintained in Group H-5 occupancies in accordance with Section 604.	2703.15 Emergency power system. An emergency power system shall be maintained in Group H-5 occupancies in accordance with Section 604.	Restores reference to section 604 for maintenance of emergency power systems.
594	CA		2703.15.1 Required electrical systems. Where provided or required by the applicable building code, emergency power shall be maintained for electrically operated equipment and connected control circuits including but not limited to the following systems in accordance with the applicable building code: 1. HPM exhaust ventilation systems. 2. HPM gas cabinet ventilation systems. 3. HPM exhausted enclosure ventilation systems. 4. HPM gas room ventilation systems. 5. HPM gas detection systems. 6. Emergency alarm systems. 7. Manual fire alarm systems. 8. Automatic sprinkler system monitoring and alarm systems. 9. Automatic alarm and detection systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4. 10. Flow alarm switches for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 2705.2.3.4. 11. Electrically operated systems required elsewhere in this code or in the applicable building code that are applicable to the use, storage or handling of HPM.	This section highlights which equipment is expected to be supported by emergency power. As indicated in Section 604, emergency power systems must be installed, in accordance with the applicable requirements of NFPA 70, NFPA 110 and NFPA 111. Note that the systems included in the list are critical to personnel safety and must remain operable under all conditions of normal power system failure or impairment.
595	CAAM	2703.15.2 Exhaust ventilation systems. Where permitted by the applicable building code, exhaust ventilation systems are allowed to be maintained to operate at not less than one-half the normal fan speed on the emergency power system when it is demonstrated that the level of exhaust will maintain a safe atmosphere.	2703.15.2 Exhaust ventilation systems. Exhaust ventilation systems are allowed to be maintained to operate at not less than one-half the normal fan speed on the emergency power system when it is demonstrated that the level of exhaust will maintain a safe atmosphere.	Restores an important exception for reduced power operations. Emergency power for exhaust ventilation is required to prevent hazardous concentrations of HPM fumes or vapors in areas such as workstations or fabrication areas. Fans for exhaust ventilation draw a considerable amount of current when operating. Running exhaust fans at a reduced speed may be desirable when it will not endanger the operator or result in a hazardous condition. However, exhaust fans must not be run at a speed less than 50 percent of their rating, even if a slower speed will not produce a serious hazard.
596	CAAM	2703.16 Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be maintained in accordance with the applicable provisions of NFPA 318 and the applicable building code.	2703.16 Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be maintained in accordance with NFPA 318 and remain in accordance with the applicable building code.	Restores reference to NFPA 318 for maintenance requirements. This section allows the storage and use of HPM gases in subatmospheric pressure gas systems (SAGS) when the systems are installed in accordance with NFPA 318. It is the intent of this section to adopt only the provisions of NFPA 318 relating to SAGS even though the scope of the standard itself covers many more aspects of semiconductor fabrication safety. Those sections in the scope of the reference are Section 3.3.28.5 for the definition, and Section 8.6.2 addressing uses and controls (see the commentary to Section 102.7 regarding the proper application of referenced standards). Semiconductor manufacturing involves the storage, handling and use of a variety of hazardous production materials. Some of the processes require the use of compressed gases that are classified by the code as being highly toxic, toxic, corrosive, flammable or pyrophoric. It is not uncommon for some of the gases to exhibit multiple hazard classifications. Because of the hazards associated with some of these materials, advancements to improve their safe storage and use have been developed. One improvement is SAGS for certain compressed gases, a primary goal of which is to improve safety by reducing the risk of a gas release. This is accomplished because SAGS only deliver gas when a vacuum is applied to the cylinder connection. In a SAGS, the cylinder valve can be opened, but no gas is released until the pressure downstream of the outlet connection is below atmospheric pressure. This is in contrast to a typical gas cylinder, which releases gas when the cylinder valve is opened. SAGS significantly reduce the risk associated with HPM because they mitigate the likelihood and magnitude of a gas release, and their use is becoming more common. The semiconductor industry has used SAGS successfully for a number of years.
597	CA		2704.1 General. Storage of hazardous materials shall comply with Section 2703 and this section and other applicable provisions of this code. 2704.2.1 Location of HPM storage in fabrication areas. Storage of HPM in fabrication areas shall be maintained under approved or listed storage cabinets, gas cabinets, exhausted enclosures or within a workstation as follows: 1. Flammable and combustible liquid storage cabinets shall comply with Section 5704.3.2. 2. Hazardous materials storage cabinets shall comply with Chapter 50. 3. Gas cabinets shall comply with Chapter 50. Gas cabinets for highly toxic or toxic gases shall also comply with Chapter 60. 4. Exhausted enclosures shall comply with Chapter 50. Exhausted enclosures for highly toxic or toxic gases shall also comply with Chapter 60. 5. Workstations shall comply with Section 2705.2.3.	Removed unnecessary language.
598	CA		2704.2.1 Storage and use in fabrication areas. The maximum quantities of hazardous materials stored or used in a single fabrication area shall not exceed the quantities set forth in Table 2704.2.2.1 unless otherwise approved by the applicable building code.  TABLE 2704.2.2.1 QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5a	Restores the technical requirements and expectations for HPM storage in fabrication areas (not construction). Even though the amount of HPM in a fabrication area is controlled, it must be further controlled by storing it in approved cabinets, exhausted enclosures or a workstation. This requirement is intended to limit the exposure to occupants of the fabrication area to only the material in use in that area. Such separation also reduces the size of a possible hazardous material incident.  The larger amounts of HPM typically stored in separate areas present a hazard comparable to other Group H facilities. Therefore, storage rooms must meet similar code requirements. Storage rooms containing HPM in quantities greater than permitted by Tables 5003.1.1(1) and 5003.1.1(2) must comply with the applicable requirements of IBC Section 415.11.5, depending on the state of the material.
599	CA		2704.3.1 HPM storage. The indoor storage of HPM in quantities greater than those listed in Sections 5003.1.1 and 3404.3.4 shall be approved by the Building Official and located in a room complying with the requirements of the applicable building code and this code for a liquid storage room, HPM room or gas room as appropriate for the materials stored.	Indicates that quantities above the thresholds listed, must be approved by the building official and comply with the applicable building code.
600	CAAM	2705.3.2.1 Existing fabrication area transportation. When existing fabrication areas are not required by the applicable building code to utilize approved service corridors, HPM is allowed to be handled and transported in accordance with Section 5003.10.	2705.3.2.1 Existing fabrication area transportation. When existing fabrication areas are not required by the applicable building code to utilize approved service corridors, HPM is allowed to be transported in existing corridors when such corridors comply with Section 5003.10 of this code and the applicable building code.	Restores reference to the operational requirements of 5003.10. This section addresses HPM facilities that existed before the adoption and enforcement of modern building codes. It permits the transport of HPM in corridors in existing buildings under the conditions specified in these sections and the applicable building code.
601	CAAM		2705.3.3 Service corridors. Where service corridors are required by the applicable building code and it is necessary to transport HPM from a liquid storage room, HPM room, gas room or from the outside of a building to the perimeter wall of a fabrication area, such transport shall be through approved service corridors.	Restores the requirement to only use approved service corridors if the facility is subject to those requirements in accordance with the applicable building code.
602	CAAM	Delete Tables 5003.1.1(1) and 5003.1.1(2)		
603	CAAM	5003.2.1 Design and construction of containers, cylinders and tanks. Portable containers and cylinders shall be designed and constructed in accordance with approved standards. Containers, cylinders, and other means used for containment of hazardous materials shall be of an approved type. Pressure vessels not meeting U.S. Department of Transportation requirements for transportation shall comply with the ASME Boiler and Pressure Vessel Code. Tanks shall be installed in accordance with the applicable building code and shall be maintained.	5003.2.1 Design and construction of containers, cylinders and tanks. Portable containers and cylinders shall be designed and constructed in accordance with approved standards. Containers, cylinders, and other means used for containment of hazardous materials shall be of an approved type. Pressure vessels not meeting U.S. Department of Transportation requirements for transportation shall comply with the ASME Boiler and Pressure Vessel Code. Tanks shall be maintained as approved in accordance with the applicable building code.	Uses the consensus based maintenance language at the end for tanks.
604	CA		5003.2.2 Piping, tubing, valves and fittings. Piping, tubing, valves, and fittings conveying hazardous materials shall be maintained in accordance with ASMEB31 or other approved standards in accordance with the applicable building code.	Restores reference to ASME B31 as an option for maintenance. Piping, tubing, valves and fittings must be maintained to meet the requirements listed in Chapters 50 through 67, and the referenced standard or other approved standards acceptable to the fire code official. ASME B31 is the primary code for pressure piping. It is divided into nine sections, each regulating a different type of piping, and it has detailed requirements for maintenance, inspection and testing.
742	CA	Delete section	5003.2.2.2 Additional regulations for supply piping for health-hazard materials, (delete)	There is no need for the 2015 VSFPCC language. Like the preceding section, this information is construction related and should be deleted.
743	CA		5003.2.3 Equipment, machinery and alarms. Equipment, machinery and detection and alarm systems associated with the use, storage or handling of hazardous materials shall be listed or approved.	The removal of "detection and alarm systems" removes part of the application of this section and is not a construction requirement. There is no need to remove that language. Equipment associated with the use or storage of hazardous materials must be listed or approved by a third-party testing agency.

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		5003.2.4.1 Underground tanks. Where provided or required by the applicable building code, secondary containment for underground tanks shall be maintained. In lieu of secondary containment for an underground tank, an above-ground tank in an underground vault complying with the applicable building code and Section 5704.2.8 shall be permitted.	5003.2.4.1 Underground tanks. Underground tanks used for the storage of liquid hazardous materials shall maintain secondary containment. In lieu of secondary containment for an underground tank, an above-ground tank in an underground vault complying with the applicable building code and Section 5704.2.8 shall be permitted.	Removed construction language and kept the exception for underground vault arrangements. Current language does not even mention the term secondary containment. Secondary containment provides an additional measure of confining hazardous materials at their point of generation in case of a tank failure. As an alternative to providing secondary containment, an above-ground tank installed in an underground vault for flammable or combustible liquids in accordance with Section 5704.2.8 is allowed as being equivalent. Note that the requirement for secondary containment is a general requirement subject to the limitations and exclusions of Section 5001.1.
744	CAAM			
		5003.2.4.2 Above-ground tanks. Above-ground stationary tanks used for the storage of hazardous materials shall be maintained in accordance with the requirements for outdoor storage of the particular material involved. Exception: Above-ground tanks that are installed in vaults complying with the applicable building code and maintained in accordance with Section 5003.16 or 5704.2.8 shall not be required to comply with location and protection requirements for outdoor storage.	5003.2.4.2 Above-ground tanks. Above-ground stationary tanks used for the storage of hazardous materials shall be maintained in accordance with the requirements for outdoor storage of the particular material involved. Exception: Above-ground tanks that are installed in vaults complying with the applicable building code and maintained in accordance with Section 5003.16 or 5704.2.8 shall not be required to comply with location and protection requirements for outdoor storage.	Restored the exception to above-ground tanks in vaults. Requirements for above-ground tanks depend on the hazards associated with the material being stored. Tank requirements can be found in Sections 2306, 5404 and 5704.2. The exception reminds that the use of an above-ground tank in a below-grade tank vault in lieu of an underground tank is permitted. A tank in a vault is regarded as equivalent in safety to an underground tank by Chapter 57, and it is a superior method with regard to environmental safety. Requirements for location on site and similar provisions should be regarded as an underground installation.
745	CA			
		5003.2.7 Liquid-level limit control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent overflowing of atmospheric tanks having a capacity greater than 500 gallons (1893 L) and which contain hazardous material liquids shall be maintained.	5003.2.7 Liquid-level limit control. Atmospheric tanks having a capacity greater than 500 gallons (1893 L) and which contain hazardous material liquids shall maintain a liquid-level limit control or other approved means to prevent overflowing of the tank in accordance with the applicable building code.	Change construction language to maintenance language. Overflowing of tanks has been a problem over the years. This section requires atmospheric tanks with a capacity greater than 500 gallons (1893 L) containing hazardous materials to maintain an approved method of fill control.
746	CAAM			
		5003.8.2 Detached buildings. Group H occupancies containing quantities of hazardous materials in excess of those set forth in the applicable building code shall be approved by the building official and located in accordance with the applicable building code.	5003.8.2 Detached buildings. Group H occupancies containing quantities of hazardous materials in excess of those set forth in Table 5003.8.2 shall be approved by the building official and located in accordance with the applicable building code.	Scoping language for the following subsections, this item is editorial not construction.
747	CA			
		5003.8.3.1 Control Areas. Fire barriers separating control areas shall be maintained in accordance with Chapter 7.	5003.8.3.1 Control Areas. Control areas separated from each other by fire barriers shall maintain those fire barriers in accordance with Chapter 7.	Removed construction language and provides a reference to Chapter 7 for fire barrier maintenance.
748	CAAM			
		5003.8.3.2 Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per control area allowed at each floor level within a building shall be maintained in accordance with this chapter and the applicable building code.	5003.8.3.2 Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per control area allowed at each floor level within a building shall be maintained in accordance with this chapter and the applicable building code. Quantities exceeding those listed in Table 5003.8.3.2 shall be approved by the Building Official in accordance with the applicable building code.	Added reference to this chapter for maintenance requirements and evaluation by the Building Official when quantities exceed the MAQ listed. The amount of hazardous materials per control area and the number of control areas per floor are typically reduced if hazardous materials are stored or used above the first floor. Difficulty in gaining access for fire fighting or other emergency response purposes and potential hazard to building occupants who must egress that area are increased above the first floor. The use of control areas on upper floors can be advantageous for multistory research and laboratory-type facilities that often have a functional need to use limited amounts of hazardous materials throughout various portions of the building. Without control areas, the MAQ for a hazardous material would be limited to an entire building area regardless of the overall size or height of the building.
749	CAAM			
		5003.8.3.4 Fire-resistance-rating requirements. The required fire-resistance rating for control areas shall be maintained in accordance with Chapter 7, this Chapter and the applicable building code.	5003.8.3.4 Fire-resistance-rating requirements. The required fire-resistance rating for control areas shall be maintained in accordance with Chapter 7, this Chapter and the applicable building code.	Added reference to this chapter and Chapter 7 for maintenance of fire resistance rated barriers.
750	CAAM			
		5003.8.4.1 Protection. Where provided or required by the applicable building code, fire protection systems and fire-rated separation shall be maintained.	5003.8.4.1 Protection. Gas rooms shall maintain fire protection systems and fire-rated separation from the remainder of the building in accordance with this code and the applicable building code.	Changed title for clarity and restored maintenance language.
751	CAAM			
		5003.8.4.2 Ventilation system. Where provided or required by the applicable building code, ventilation systems for gas rooms shall be operated and maintained. Highly toxic and toxic gases shall comply with Section 6004.2.2.6 and the applicable building code.	5003.8.4.2 Ventilation system. The ventilation system for gas rooms shall be maintained in accordance with this chapter, Chapter 60, and the applicable building code.	Removed construction language and restored reference to Chapter 60.
752	CAAM			
		5003.8.5 Exhausted enclosures. Where an exhausted enclosure is used to increase maximum allowable quantity per control area, the exhausted enclosure shall be maintained in accordance with this chapter, Chapter 60, and the applicable building code.	5003.8.5 Exhausted enclosures. Where an exhausted enclosure is used to increase maximum allowable quantity per control area, the exhausted enclosure shall be maintained in accordance with this chapter, Chapter 60, and the applicable building code.	Restored reference to Chapter 60.
753	CAAM			
		5003.8.5.1 Materials. Exhausted enclosures shall be maintained as approved by the applicable building code. Where noncombustible materials were required by the applicable building code, combustible materials are prohibited.	5003.8.5.1 Construction. Exhausted enclosures shall remain as and be maintained with noncombustible materials unless otherwise approved by the applicable building code.	Removed construction language and restored the reference to non-combustible materials.
754	CAAM			
		5003.8.5.2 Ventilation. Where provided or required by the applicable building code, the ventilation system for exhausted enclosures shall be operated and maintained. Ventilation systems used for highly toxic and toxic gases shall comply with this chapter, items 1, 2 and 3 of Section 6004.1.3, and the applicable building code.	5003.8.5.2 Ventilation. The ventilation system for exhausted enclosures shall be maintained in accordance with this chapter, Chapter 60, and approved by the applicable building code.	Removed construction language and restored reference to Chapter 60.
755	CAAM			
		5003.8.5.3 Fire-extinguishing system. Where provided or required by the applicable building code, fire-extinguishing systems for exhaust enclosures shall be maintained in accordance with Chapter 9 and the applicable building code.	5003.8.5.3 Fire-extinguishing system. Fire-extinguishing systems required for exhaust enclosures shall be maintained in accordance with Chapter 9 and the applicable building code.	Added reference to Chapter 9 for fire protection system maintenance
756	CAAM			
		5003.8.6.2 Ventilation. Where provided or required by the applicable building code, the ventilation system for gas cabinets shall be operated and maintained. Ventilation systems used for highly toxic and toxic gases shall comply with this chapter, items 1, 2 and 3 of Section 6004.1.2, and the applicable building code.	5003.8.6.2 Ventilation. The ventilation system for gas cabinets shall be maintained in accordance with this chapter, Chapter 60, and approved by the applicable building code.	Removed construction language and restored reference to Chapter 60.
757	CAAM			
		5003.9.9 Shelf storage. Shelving shall be of substantial construction, comply with the requirements of this chapter and the applicable Building Code. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers. Exceptions: 1.Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use. 2.Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5. Shelf storage of hazardous materials shall be maintained in an orderly manner.	5003.9.9 Shelf storage. Shelving shall be of substantial construction, comply with the requirements of this chapter and NFPA 30, and shall be braced and anchored in accordance with the seismic design requirements of the applicable Building Code. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers. Exceptions: 1.Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use. 2.Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5. Shelf storage of hazardous materials shall be maintained in an orderly manner.	Shelf storage and construction is an operational requirement and not a building code requirement. Shelf storage is not addressed in the applicable building code but is addressed in NFPA 30. Shelves are not a component of building construction. Where hazardous chemicals are stored on shelves, the shelves must have a lip or guard at the edges. The shelving must be treated or otherwise protected to be compatible with the chemicals stored.
758	CAAM			
		5003.11.3.1 Density. Storage and display of solids shall not exceed the density of floor area allowed by the applicable building code. Storage and display of liquids shall not exceed the amount per square foot allowed by the applicable building code.	5003.11.3.1 Density. Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m <sup>2</sup> ) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m <sup>2</sup> ) of floor area actually occupied by liquid merchandise.	This is not design or construction criteria but rather a limitation to the quantity of material on display (operational requirement).
759	CAAM			
		5004.1 Spill control and secondary containment for liquid and solid hazardous materials. Spill control and secondary containment for rooms, buildings or areas used for the storage of liquid or solid hazardous materials shall be maintained in accordance with Sections 5004.2.1 through 5004.2.3 and the applicable building code. Exception: Outdoor storage of containers on approved containment pallets in accordance with Section 5004.2.3.	5004.1 Spill control and secondary containment for liquid and solid hazardous materials. Spill control and secondary containment for rooms, buildings or areas used for the storage of liquid or solid hazardous materials shall be maintained in accordance with this Chapter the applicable building code. Exception: Outdoor storage of containers on approved containment pallets in accordance with Section 5004.2.3.	Restored reference to maintenance requirements of this chapter as well as the applicable building code. This section introduces the specific requirements for spill control and secondary containment for solid and liquid hazardous materials. The exception recognizes the innovation of containment pallets and their suitability for preventing the spread of hazardous materials spills in outdoor control areas
760	CAAM			
		5004.2.1 Spill control for hazardous material liquids. Where provided or required by the applicable building code, spill control for hazardous materials shall be maintained. For individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) spill control shall be maintained to prevent the flow of liquids to adjoining areas in accordance with the applicable building code.	5004.2.1 Spill control for hazardous material liquids. Unless otherwise required by the applicable building code, rooms, buildings or areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L), shall maintain spill control to prevent the flow of liquids to adjoining areas in accordance with the applicable building code.	Removed construction and design related language but restored the threshold where spill control must be maintained. The requirement for spill control in a room or area is based on two items. The first is that the storage container(s) have a capacity of more than 55 gallons (208 L). The second is that the aggregate capacity of multiple vessels be more than 1,000 gallons (3785 L). The area, once determined to require spill control, must be protected so that the containment area will handle the release from the largest container in the area.
761	CAAM			
		5004.2.2 Secondary containment for hazardous material liquids and solids. Where provided or required by the applicable building code, secondary containment for hazardous materials shall be maintained.	5004.2.2 Secondary containment for hazardous material liquids and solids. Unless otherwise required by the applicable building code, buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall maintain secondary containment in accordance with the applicable building code and this section when the capacity of an individual vessel or the aggregate capacity of multiple vessels exceeds the following: 1.Liquids: Capacity of an individual vessel exceeds 55 gallons (208 L) or the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L); and 2.Solids: Capacity of an individual vessel exceeds 550 pounds (250 kg) or the aggregate capacity of multiple vessels exceeds 10,000 pounds (4540 kg).	Restores the thresholds for when secondary containment should be reviewed to be maintained in accordance with the applicable building code.
762	CAAM			
		5004.2.2.5 Monitoring. An approved monitoring method shall be provided to detect hazardous materials in the secondary containment system. The monitoring method is allowed to be visual inspection of the primary or secondary containment, or other approved means. Where secondary containment is subject to the intrusion of water, a monitoring method for detecting water shall be provided. Where monitoring devices are provided, they shall be maintained in accordance with the applicable building code.	5004.2.2.5 Monitoring. An approved monitoring method shall be provided to detect hazardous materials in the secondary containment system. The monitoring method is allowed to be visual inspection of the primary or secondary containment, or other approved means. Where secondary containment is subject to the intrusion of water, a monitoring method for detecting water shall be provided. Where monitoring devices are provided, they shall remain connected to approved visual or audible alarms in accordance with the applicable building code.	This section is not a construction requirement but rather ensuring that some means (visual or automatic) is maintained to monitor the containment. Visual inspection alone of the primary or secondary containment system is permitted. Electronic systems should be maintained connected to both audible and visual alarms.
763	CAAM			
		5004.2.2.6 Drainage system design. Drainage systems shall be maintained in accordance with this Chapter and the applicable building code.	5004.2.2.6 Drainage system design. Drainage systems shall be maintained in accordance with this Chapter and the applicable building code.	Restored reference to compliance with this chapter.
764	CAAM			

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783	CAAM	5004.3 Ventilation. Indoor storage areas and storage buildings shall maintain ventilation in accordance with the applicable building code and shall be operated and maintained in accordance with this Chapter. Storage areas for flammable solids shall comply with Chapter 59.	5004.3 Ventilation. Indoor storage areas and storage buildings shall maintain ventilation in accordance with the applicable building code and shall be operated and maintained in accordance with this Chapter. Exception: Storage areas for flammable solids complying with Chapter 59.	Added operations and maintenance language as well as the exception for flammable solids. Indoor storage areas and buildings must be ventilated either mechanically or naturally so that the level of vapors is maintained below the LFL or PEL. Keeping the area/building at these levels maintains a level of safety for the area. Storage areas for flammable solids that meet the requirements of Chapter 59 are exempted from this requirement.
784	CA		5004.5 Automatic sprinkler systems. Automatic sprinkler systems for the storage of hazardous materials shall be maintained in accordance with this Chapter, chapter 9 and the applicable building code.	Added reference to fire protection system maintenance in accordance with Chapter 9
785	CA		5004.6 Explosion control. Explosion control for storage rooms, areas and buildings shall be maintained in accordance with this chapter, chapter 9 and the applicable building code.	Added reference to explosion control system maintenance in accordance with Chapter 9.
786	CAAM	5004.7 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 1203, and this Chapter.	5004.7 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 604, and this Chapter.	Restored the list of items that may be required to have standby or emergency power and provided additional references for maintenance requirements. A backup emergency power source is considered essential for required systems monitoring and sensing hazardous materials; therefore, when limit controls, detection systems or mechanical ventilation is required for a specific hazardous material, an emergency electrical system or standby power system is required to also be maintained.
787	CA		5004.8 Limit controls. Limit controls shall be maintained in accordance with Sections 5004.8.1 and 5004.8.2.	Changed "provided" to "maintained" and restored the editorial scoping language.
788	CAAM	5004.8.1 Temperature control. Where provided or required by the applicable building code, temperature control devices for materials that must be kept at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall be maintained to keep the temperature within a safe range.	5004.8.1 Temperature control. Where materials that must be kept at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall maintain a means to maintain the temperature within a safe range method in accordance with this Chapter and the applicable building code.	Changes from construction language to maintenance language. When a chemical is temperature sensitive, a temperature control system with a redundant backup is required to be maintained.
789	CAAM	5004.8.2 Pressure control. Where provided or required by the applicable building code, pressure control devices on stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of exposure fires or internal reaction shall be maintained to relieve excessive internal pressure.	5004.8.2 Pressure control. Stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of exposure fires or internal reaction shall maintain an approved means that will relieve excessive internal pressure in accordance with the applicable building code.	Changes from construction language to maintenance language. Emergency vents must be maintained when the vapor density of a chemical could cause a boiling liquid expanding vapor explosion (BLEVE) during a fire.
790	CAAM	5004.9 Emergency alarm. Where provided or required by the applicable building code, manual emergency alarm systems in rooms or areas used for storage of hazardous materials shall be maintained in accordance with Chapter 9 and the applicable building code.	5004.9 Emergency alarm. Where provided, an approved manual emergency alarm system shall be maintained in buildings, rooms or areas used for storage of hazardous materials in accordance with Chapter 9 and the applicable building code.	Removed construction language and provided reference to Chapter 9 for maintenance requirements.
791	CA		5004.10 Supervision and monitoring. Where emergency alarm, detection and automatic fire-extinguishing systems are required by the applicable building code to be electrically supervised they shall maintain monitoring by an approved supervising station, or when approved, sound an audible and visual signal at a constantly attended on-site location.	Changes from construction language to maintenance language. Where required by the applicable building code, emergency alarm systems, detection systems and automatic extinguishing systems must be supervised by an approved central, proprietary or remote station system. Where a facility has an on-site, "constantly attended location" (as defined in Chapter 2) staffed by qualified personnel who can respond to signals in a timely fashion, monitoring of audible and visual signals by such an attended location in lieu of off-site transmission to an approved supervising station may be permitted.
792	CA		5004.12 Noncombustible Floors. Except for surfacing, floors of storage areas shall remain non-combustible where required by the applicable building code.	Changes from construction language to maintenance language.
793	CA		5005.1 General. Use, dispensing and handling of hazardous materials in amounts exceeding the maximum allowable quantity per control area shall be maintained in accordance with Sections 5001, 5003 and 5005 and the applicable building code. Use, dispensing and handling of hazardous materials in amounts not exceeding the maximum allowable quantity per control area set forth in Section 5003.1 shall be maintained in accordance with Sections 5001 and 5003 and the applicable building code.	Restored scoping language to clarify how this chapter and section is to be used for maintenance purposes. This entire section used to be the additional use/handling requirements for when quantities exceeded the MAQ. As proposed, any amounts exceeding the MAQ are subject to approval by the Building Official in accordance with the applicable building code. The current language applies this section to ALL hazardous materials storage which is NOT the intent of the IFC.
794	CA		5005.1.2 Noncombustible floor. Except for surfacing, floors of areas where liquid or solid hazardous materials are dispensed or used in open systems shall be maintained as noncombustible, and liquid-tight where required by the applicable building code.	Changes from construction to maintenance language.
795	CAAM	5005.1.3 Spill control and secondary containment for hazardous material liquids. Where provided or required by the applicable building code, spill control and secondary containment for hazardous materials shall be maintained in accordance with Section 5004.2 and the applicable building code.	5005.1.3 Spill control and secondary containment for hazardous material liquids. Where required by the applicable building code, spill control and secondary containment shall be maintained in accordance with section 5004.2 and the applicable building code.	Restores the reference to 5004.2 for maintenance requirements. If required by the applicable building code, the spill control and secondary containment must continue to meet the requirements of Section 5004.2.
796	CA		5005.1.4 Limit controls. Limit controls shall be maintained in accordance with Sections 5005.1.4.1 through 5005.1.4.4.	Changes "provided" to "maintained" and restores the editorial scoping language.
797	CAAM	5005.1.4.1 High-liquid-level control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent overflowing of open tanks shall be maintained.	5005.1.4.1 High-liquid-level control. Where required by the applicable building code, open tanks in which liquid hazardous materials are used shall maintain a liquid-level limit control or other means to prevent overflowing of the tank.	When there is a danger of overflowing a tank, especially in open systems, liquid-level controls are required to be maintained.
798	CAAM	5005.1.4.2 Low-liquid-level control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent a low-liquid level in a tank from creating a hazardous condition, including but not limited to, overheating of a tank or its contents.	5005.1.4.2 Low-liquid-level control. Where required by the applicable building code, approved safeguards shall be maintained to prevent a low-liquid level in a tank from creating a hazardous condition, including but not limited to, overheating of a tank or its contents.	Changes from construction to maintenance language. If the method of storage can allow for the collapse of the tank or other types of failure as a result of a low level of chemicals, low-liquid-level controls are required to be maintained.
799	CAAM	5005.1.4.3 Temperature control. Where provided or required by the applicable building code, temperature controls shall be maintained in accordance with Section 5004.8.1.	5005.1.4.3 Temperature control. Where required by the applicable building code, temperature controls shall be maintained in accordance with Section 5004.8.1.	Changes from construction to maintenance language. Similar section in 5004.
800	CAAM	5005.1.4.4 Pressure control. Where provided or required by the applicable building code, pressure controls shall be maintained in accordance with section 5004.8.2.	5005.1.4.4 Pressure control. Where pressure controls are required by the applicable building code they shall be maintained in accordance with section 5004.8.2.	Changes from construction to maintenance language. Similar section in 5004.
801	CAAM	5005.1.5 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 1203, and this Chapter.	5005.1.5 Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 604, and this Chapter.	Changes from construction to maintenance language. Similar section in 5004.
802	CA		5005.1.6 Supervision and monitoring. Where emergency alarm, detection and automatic fire-extinguishing systems are required by the applicable building code to be electrically supervised they shall maintain monitoring by an approved supervising station, or when approved, sound an audible and visual signal at a constantly attended on-site location.	Changes from construction to maintenance language. Similar section in 5004.
803	CA		5005.1.7 Lighting. Natural or artificial lighting provided for use, dispensing and handling of hazardous materials shall be maintained in accordance with this chapter, Chapter 6, and the applicable building code.	Retains IFC language and provides references to maintenance requirements. All areas with hazardous materials must be maintained as adequately lighted.
804	CA		5005.1.8 Fire-extinguishing systems. Where Fire-extinguishing systems for rooms or areas in which hazardous materials are dispensed or used are required by the applicable building code they shall be maintained in accordance with this Chapter, Chapter 9, and the applicable building code.	Added reference to fire protection maintenance requirements of Chapter 9.
805	CAAM	5005.1.9 Ventilation. Where provided or required by the applicable building code, exhaust ventilation for indoor dispensing and use areas shall be operated and maintained in accordance with the applicable building code and Section 5004.3. Exception: Ventilation is not required for dispensing and use of flammable solids other than finely divided particles.	5005.1.9 Ventilation. Indoor dispensing and use areas shall be operated and maintained with exhaust ventilation in accordance with the applicable building code and Section 5004.3. Exception: Ventilation is not required for dispensing and use of flammable solids other than finely divided particles.	Changes from construction to maintenance language and restores the exception. Exhaust ventilation meeting the requirements of Section 5004.3 must be maintained in indoor use and dispensing areas so that the level of vapors is maintained below the LFL or the PEL. Keeping the area/building at these levels provides a level of safety for the area.
806	CAAM	5005.2.1.3 Spill control for hazardous material liquids. Where spill control is provided in accordance with the applicable building code for buildings, rooms, or areas where hazardous material liquids are dispensed into vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity, it shall be maintained in accordance with this Chapter.	5005.2.1.3 Spill control for hazardous material liquids. Buildings, rooms, or areas where hazardous material liquids are dispensed into vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be maintained with spill control in accordance with Section 5004.2.1 and the applicable building code.	Changed "provided" to "maintained" and restored reference to section 5004.2.1. Operational required that when dispensing hazardous materials into containers larger than 1.3 gallons (5 L) or in an open system with a capacity of 5.3 gallons (20 L), spill control must be provided.
807	CA		5005.2.2 Closed systems. Use of hazardous materials in closed containers or systems shall be in accordance with Sections 5005.2.2.1 through 5005.2.2.4.	Restored editorial scoping language for the section.
808	CAAM	5005.2.2.1 Ventilation. Where closed systems are designed to be opened as part of normal operations, ventilation required by the applicable building code shall be operated and maintained in accordance with Section 5005.2.1.1.	5005.2.2.1 Ventilation. Where closed systems are designed to be opened as part of normal operations, ventilation required by the applicable building code shall be maintained in accordance with Section 5005.2.1.1.	Requires maintenance of ventilation where required by the applicable building code. References back to 5005.2.1.1.
809	CAAM	5005.2.2.2 Explosion control. Where provided or required by the applicable building code, explosion control shall be maintained in accordance with Section 5004.6 where an explosive environment exists because of the hazardous materials dispensed or used, or as a result of the dispensing or use process. Exception: Where process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions based on the most likely failure.	5005.2.2.2 Explosion control. Where required by the applicable building code, explosion control shall be maintained in accordance with Section 5004.6 where an explosive environment exists because of the hazardous materials dispensed or used, or as a result of the dispensing or use process. Exception: Where process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions based on the most likely failure.	Restores technical provisions from the IFC where required by the applicable building code. Also restores the IFC exception. If the use or process could produce an explosion and the vessels are not rated as explosion proof, explosion control must be maintained to meet the requirements of Section 5004.6. The exception covers process vessels designed to contain potential explosions.
810	CA		5005.4 Handling. Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.	Restored editorial scoping language for the section.
811	CAAM	5005.4.4 Dispensing, use and handling. Hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 shall not be transported through corridors, interior exit stairways or ramps or exit passageways, unless such areas maintain an emergency telephone system, a local manual alarm station or an approved alarm-initiating device throughout the transport route in accordance with the applicable building code. Where required by the applicable building code, the signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.	5005.4.4 Dispensing, use and handling. Unless otherwise permitted by the applicable building code, hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 should not be transported through corridors, interior exit stairways or ramps or exit passageways, unless such areas maintain an emergency telephone system, a local manual alarm station or an approved alarm-initiating device throughout the transport route. Where required by the applicable building code, the signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.	Restores the technical provisions of the IFC to ensure that hazardous materials are not transported in unauthorized locations. When exit corridors or exit enclosures are used to transport hazardous materials with a ranking of 3 or 4, specific operational requirements and safety systems must be in place. This is not a construction requirement.
812	CAAM	5104.1 General. The inside storage of Levels 2 and 3 aerosol products shall be maintained in accordance with section 5104.2 through 5104.7, the applicable provisions of NFPA 30B, and remain in accordance with the applicable building code.	5104.1 General. The inside storage of Levels 2 and 3 aerosol products shall be maintained in accordance with section 5104.2 through 5104.7, NFPA 30B, and remain in accordance with the applicable building code.	Restores the reference to NFPA 30B for maintenance requirements as well as the editorial language for the subsections.
813	CA		5104.3.2 Storage in general purpose warehouses. Aerosol storage in general purpose warehouses utilized only for warehousing-type operations involving mixed commodities shall be maintained in accordance with Section 5104.3.1 or 5104.3.2 and remain in accordance with the applicable building code.	Restores editorial language for the subsections. General purpose warehouses are used for storing general commodities and aerosol products (i.e., "mixed commodities"). Aerosol product storage located in general purpose warehouses is classified as either nonsegregated storage (see Section 5104.3.1) or segregated storage (see Section 5104.3.2).
814	CA		5104.4.1 Automatic sprinkler system capability. Aerosol warehouses protected by an approved wet-pipe automatic sprinkler system in accordance with NFPA 30B and the applicable building code shall be maintained in accordance with Chapter 9. The highest classification level of aerosol product present shall not exceed the capability of the approved sprinkler system.	Distribution warehouses for major department store chains containing large amounts of aerosols and various common mercantile commodities are typical of buildings classified as general purpose warehouses. Proper protection and separation of aerosol product storage areas are essential to protect ordinary storage commodities from the hazards of aerosol products in these types of buildings.
815	CA		5104.4.1 Automatic sprinkler system capability. Aerosol warehouses protected by an approved wet-pipe automatic sprinkler system in accordance with NFPA 30B and the applicable building code shall be maintained in accordance with Chapter 9. The highest classification level of aerosol product present shall not exceed the capability of the approved sprinkler system.	Restores the reference to NFPA 30B. The automatic sprinkler system for aerosol warehouses must be maintained in accordance with NFPA 30B criteria. The sprinkler protection must be arranged for the highest hazard (i.e. Level 3 aerosol products if both Level 2 and 3 aerosols are stored in the aerosol warehouse).

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834	CA		5104.4.2 Pile and palletized storage aisles. Solid pile and palletized storage shall be arranged so the maximum travel distance to an aisle is 25 feet (7620 mm). Aisles shall have a minimum width of 4 feet (1219 mm).	Operational requirements for storage arrangements. The maximum travel distance of 25 feet (7620 mm) to an aisle provides an adequate means of egress if an emergency occurs. This results in an allowable storage area of 50 feet by 50 feet (15 240 mm by 15 240 mm) surrounded by 4-foot (1219 mm) aisles for palletized and pile storage. The 4-foot (1219 mm) aisle width, in conjunction with a sprinkler system and in accordance with NFPA 30B, reduces the chance of fire spread across aisles involving pile and palletized storage.
835	CA		5104.4.3 Rack storage aisles. Rack storage shall be maintained in accordance with Chapter 32 and remain in accordance with the applicable building code.	Clarifies that rack storage is to be in accordance with Chapter 32 and the applicable building code.
836	CA		5104.4.4 Combustible commodities. Combustible commodities other than flammable and combustible liquids shall be permitted to be stored in an aerosol warehouse. Exception: Flammable and combustible liquids in 1-quart (946 mL) metal containers and smaller shall be permitted to be stored in an aerosol warehouse.	Restores technical guidance for operations where storage includes other combustible materials. Based on the full-scale aerosol product fire tests discussed in earlier sections of the commentary, this section allows ordinary combustible commodities to be stored in aerosol warehouses, provided that the fire protection system for the entire facility is based on the appropriate fire protection design table from NFPA 30B and Section 5104.4.1. This is consistent with and correlates with Section 6.3.6.7 of NFPA 30B. See the commentary to Section 5203 for information on the classification of combustible commodities.  The exception allows small, 1 quart [32 ounce (0.95 L)] metal containers of flammable and combustible liquids to be stored in aerosol warehouses, along with the ordinary combustible commodities discussed in the previous paragraph, provided that the fire protection system for the entire facility is based on the appropriate fire protection design table from NFPA 30B. This is consistent with and correlates with Section 6.3.6.8 of NFPA 30B.
837	CAAM	5104.5 Storage in inside flammable liquid storage rooms. Inside flammable liquid storage rooms shall be maintained in accordance with Section 5104.3.7 unless otherwise approved by the applicable building code. The maximum quantities of aerosol products shall be maintained in accordance with the applicable code.	5104.5 Storage in inside flammable liquid storage rooms. Inside flammable liquid storage rooms shall be maintained in accordance with NFPA 30B. Unless otherwise approved by the applicable building code, the storage shall be maintained within segregated storage areas in accordance with Section 5104.3.2 and Sections 5104.6.1 through 5104.6.3.	his section recognizes another operational arrangement option for storing Level 2 and 3 flammable liquid storage room meeting the requirements of Section 5104.3.7 may be more economical.  Sections 5104.5.1 and 5104.5.2 limit maximum quantities of Level 2 and 3 aerosols that can be stored in an inside flammable liquid storage room depending on the size of the room and the degree of fire-resistance-rated separation and automatic sprinkler protection installed. Indicated maximum quantities of aerosol products are the same quantities listed in Section 5104.2. See the commentary to Section 202 for the definition of "Liquid storage room."  Storage of aerosols exceeding the quantities indicated in Sections 5104.5.1 and 5104.5.2, and the storage of flammable and combustible liquids exceeding maximum allowable quantities (MACs), must be reviewed by the building official and possibly classified as high-hazard Group H occupancies.
840	CA	5104.6 Storage in liquid warehouses. The storage of Level 2 and 3 aerosol products in liquid warehouses shall be maintained in accordance with the applicable provisions of NFPA 30B. Unless otherwise approved by the applicable building code, the storage shall be maintained within segregated storage areas in accordance with Section 5104.3.2 and Sections 5104.6.1 through 5104.6.3.	5104.6 Storage in liquid warehouses. The storage of Level 2 and 3 aerosol products in liquid warehouses shall be maintained in accordance with NFPA 30B. Unless otherwise approved by the applicable building code, the storage shall be maintained within segregated storage areas in accordance with Section 5104.3.2 and Sections 5104.6.1 through 5104.6.3.	Provides editorial language for the following subsections. Also provides technical operational guidance for containment.
842	CA		5104.6.2 Sprinkler system. Sprinkler protection shall be maintained in accordance with Chapter 9.	Changes from construction to maintenance language.
843	CA		5104.6.3 Opening protection into segregated storage areas. Fire doors or gates opening into the segregated storage area shall be maintained in accordance with Chapter 7 and remain in accordance with the applicable building code.	There is no maintenance language in the applicable building code. Provides the proper reference to maintaining fire rated protections.
844	CAAM	5104.7 Storage in Group M occupancies. Storage of Level 2 and 3 aerosol products in occupancies in Group M shall be maintained in accordance with the applicable building code. Retail display shall be maintained in accordance with Section 5106.	5104.7 Storage in Group M occupancies. Storage of Level 2 and 3 aerosol products in occupancies in Group M shall be maintained in accordance with Table 5104.7 unless otherwise approved in accordance with the applicable building code. Retail display shall be maintained in accordance with Section 5106.	Both this section and Table 5104.7 contain storage limitations for Level 2 and 3 aerosol products in the storage area of a mercantile occupancy that is physically separated from the sales area and not accessible to the public. These areas are generally referred to as "back-stock" storage areas. The storage limitation for aerosol products located in the retail sales area of mercantile occupancies is specified in Section 5106. These are not construction requirements.
846	CAAM	5106.1 General. This section shall apply to the retail display of 500 pounds (227 kg) or more of Level 2 and 3 aerosol products.  5106.2.1 Maximum quantities in retail display areas. Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in the applicable building code.	5106.1 General. This section shall apply to the retail display of 500 pounds (227 kg) or more of Level 2 and 3 aerosol products.  5106.2.1 Maximum quantities in retail display areas. Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in Table 5106.2.1.	Provides technical scoping language for this section. Section 5106.2.1 Restores proper sections and references for the parent section which has not been modified.
848	CA		5106.2.2 Display of containers. Level 2 and 3 aerosol containers shall not be stacked more than 6 feet (1829 mm) high from the base of the aerosol array to the top of the aerosol array unless the containers are placed on fixed shelving or otherwise secured in an approved manner. When storage or retail display is on shelves, the height of such storage or retail display to the top of aerosol containers shall not exceed 6 feet (2438 mm).	Provides technical language regarding storage arrangements on shelving and retail display. This is not construction.
849	CA		5106.2.3 Combustible cartons. Aerosol products located in retail display areas shall be removed from combustible cartons. Exceptions: 1. Display areas that use a portion of combustible cartons that consist of only the bottom panel and not more than 2 inches (51 mm) of the side panel are allowed. 2. When the display area is protected in accordance with Tables 6.3.2.7(a) through 6.3.2.7(i) of NFPA 30B, storage of aerosol products in combustible cartons is allowed.	Regulating the packaging and display of products is not construction related. Removing combustible cartons from display areas reduces the potential fuel supply in case of a fire and also removes the combustible material that would surround the aerosol aerosols and heat them to the point that they could ignite, "rocket" or explode. It also keeps the display more open so that sprinklers can reach the individual containers more easily to help keep them below dangerous temperatures, as well as control or extinguish fire in other surrounding combustibles.  Exception 1 allows cut-down cartons in displays because they represent a somewhat reduced fuel load for a fire and also leave the sides of the aerosol containers exposed so that sprinkler water can reach them. The carton bottoms also help stabilize stacks in displays to keep them from toppling.  Exception 2 allows use of cartons in aerosol display and merchandising areas, which are protected in accordance with Tables 6.3.2.7(a) through 6.3.2.7(i) of NFPA 30B in accordance with Section 5106.3.
850	CAAM	5106.2.4 Retail display automatic sprinkler system. When an automatic sprinkler system is required for the protected retail display of aerosol products, the wet-pipe automatic sprinkler system shall be maintained in accordance with Chapter 9.	5106.2.4 Retail display automatic sprinkler system. When an automatic sprinkler system is required for the protected retail display of aerosol products, the wet-pipe automatic sprinkler system shall be maintained in accordance with Chapter 9 and remain in accordance with NFPA 13 of the applicable building code.	There is no maintenance language in the applicable building code. Provides the proper reference to maintaining fire protection systems.
851	CAAM	5106.3 Aerosol display and normal merchandising exceeding 8 feet (2438 mm) high. Aerosol display and merchandising exceeding 8 feet in height shall be maintained in accordance with Sections 5106.3.1 through 5106.3.3. 5106.3.1 Maximum quantities in retail display areas. Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in the applicable building code.	5106.3 Aerosol display and normal merchandising exceeding 8 feet (2438 mm) high. Aerosol display and merchandising exceeding 8 feet in height shall be maintained in accordance with Sections 5106.3.1 through 5106.3.3. Maximum quantities in retail display areas. Aerosol products in retail display areas shall not exceed quantities needed for display and normal merchandising and shall not exceed the quantities in Table 5106.2.1, with fire protection in accordance with Section 5106.3.2.	
854	CA		5106.5.1 Fire protection. Fire protection for the display and merchandising of Level 2 and 3 aerosols in double-row racks shall be maintained in accordance with Chapter 9, and the applicable provisions of NFPA 30B.	This is the third method referred to in Section 5106.3.3, Item 2.3, for the separation of Level 2 and 3 aerosol display and merchandising areas from flammable and combustible liquid storage and display areas.  This special protection design is based on large-scale fire testing, with the storage arrays and sprinkler protection based on that testing. Rather than requiring the separation of aerosols and liquids in retail display and merchandising, it is a specific method to allow some of these products to be adjacent to one another. These are operational requirements, not construction.
855	CA		5106.5.2 Carton products. Level 2 and 3 aerosols displayed or merchandised more than 8 feet (2438 mm) above the finished floor shall be in cartons.	Regulating carton products is not a construction requirement. The Level 2 and 3 aerosols displayed or merchandised up to 8 feet (2438 mm) in height are allowed to be uncartoned or in display-cut cartons. All aerosols stored or displayed higher than 8 feet (2438 mm) must be in cartons to satisfy this special method.
857	CA		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 shall maintain protection from an approved NFPA-13 sprinkler system where required in accordance with the applicable building code.	Maintenance of sprinkler protection is critical to the proper protection of aerosols adjacent to high heat release rate products such as plastics. This section recognizes that most, if not all aerosols adjacent to these plastic commodities require sprinkler protection by the applicable building code.
858	CAAM	5106.5.8 Flammable and combustible liquids. Class I, II, III A and III B Liquids shall be allowed to be maintained adjacent to Level 2 and 3 aerosol products in accordance with the applicable building code.	5106.5.8 Flammable and combustible liquids. Unless otherwise approved in accordance with the applicable building code, Class I, II, III A and III B Liquids shall be allowed to be maintained adjacent to Level 2 and 3 aerosol products when the following conditions are met: 1. Class I, II, IIIA and IIIB liquid containers. Containers for Class I, II, IIIA and IIIB liquids shall be limited to 1.06-gallon (4 L) metal-relieving and nonrelieving style containers and 5.3-gallon (20 L) metal-relieving style containers, and 2. Fire protection for Class I, II, IIIA and IIIB Liquids: Automatic sprinkler protection for Class I, II, IIIA and IIIB liquids shall be in accordance with Chapter 57.	Operational requirements for flammable and combustible liquids stored near aerosol products. This section identifies the maximum size and style of metal containers that must be used for flammable and combustible liquids stored adjacent to the aerosols. Section 6.8.1.3 and Appendix A-6.8.1.3 of NFPA 30 provide information on relieving- and nonrelieving-type metal containers.  No plastic containers of flammable or combustible liquids are allowed for this special protection design. Fire protection for the flammable and combustible liquids must be in accordance with Chapter 57.
859	CAAM	5107.1 General. Manufacturing facilities shall be maintained in accordance with the applicable provisions of NFPA30B and remain in accordance with the applicable building code.	5107.1 General. Manufacturing facilities shall be maintained in accordance with NFPA30B and remain in accordance with the applicable building code.	Restores reference to NFPA 30B. The hazards of aerosol manufacturing are significantly different from those of a storage facility where aerosols are stored in cartons in their individual steel or aluminum containers. The manufacturing process involves the hazards of handling flammable and combustible liquids under pressure and potentially in aerosol form, which is an even greater fire hazard. The code relies upon the referenced standard, NFPA 30B, for the regulation of aerosol manufacturing facilities.

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860	CAAM	5303.16 Vaults. Where approved by the applicable building code, generation, compression, storage and dispensing equipment for compressed gases located in either above- or below-grade vaults shall be maintained in accordance with Sections 5303.16.1 through 5303.16.14.	5303.16 Vaults. Where approved by the applicable building code, generation, compression, storage and dispensing equipment for compressed gases shall be allowed to be located in either above- or below-grade vaults when maintained in accordance with Sections 5303.16.1 through 5303.16.14.	Restores technical provisions to allow options provided by the IFC. This section extends the permissible use of vaults to include gaseous materials. The code previously allowed vaults to be used for the protection of all hazardous material liquids, but the protection features have been modified for inclusion in Chapter 53 to accommodate the protection of compressed gases. The provisions of the section are derived from Section 5704.2.8, which regulates vaults used for flammable and combustible liquids. The code has previously allowed gases to be stored and handled inside of buildings, and it is also appropriate to allow gas storage and handling equipment to be in vaults, given that a vault environment is unoccupied and offers fewer possible accident scenarios.
861	CA	5306.2 Interior supply location. Unless otherwise approved by the applicable building code, medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. Medical gases shall be stored in areas and in quantities approved under the applicable building code.	5305.5 Venting. Venting shall be operated, maintained and directed to an approved location in accordance with this chapter and the applicable building code. 5306.2 Interior supply location. Unless otherwise approved by the applicable building code, medical gases shall be stored in areas dedicated to the storage of such gases without other storage or uses. Where containers of medical gases in quantities greater than the permit amount are located inside buildings, they shall remain in protected and ventilated rooms or gas cabinets in accordance with the applicable building code. Rooms or areas where medical gases are stored or used in quantities exceeding the maximum allowable quantity per control area as set forth in Section 5003.3 and the applicable building code shall be reviewed by the building official for classification as high-hazard Group H occupancies in accordance with the applicable building code.	Restores reference to this chapter in addition to the applicable building code. This section indicates that gases must be vented to an approved location. Provides technical provisions for storing medical gases inside of buildings. This section states that medical gases must be stored in dedicated areas not used for other storage or any other purpose. Where medical gases are stored above the MAQ, review by the building official is required for approval as a Group H occupancy in accordance with the applicable building code.
862	CAAM	5307.2 Ventilation. Indoor storage and use areas and storage buildings shall be maintained with ventilation in accordance with Section 5004.3 and the applicable building code. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied.	5307.2 Ventilation. Indoor storage and use areas and storage buildings shall be maintained with ventilation in accordance with Section 5004.3 and the applicable building code. Where mechanical ventilation is provided, the systems shall be operational during such time as the building or space is occupied. Exceptions: A gas detection system complying with Section 5307.2.1 and the applicable building code shall be permitted in lieu of mechanical ventilation. Areas containing insulated liquid carbon dioxide systems used in beverage dispensing applications shall comply with Section 5307.3 and the applicable building code.	The proposed is based on the 2018 IFC.
863	CAAM	5307.2.1 Gas detection system. In rooms or areas not operating with ventilation in accordance with Section 5307.2, a gas detection system, complying with the applicable building code or, where approved by the building official, an oxygen depletion alarm system, either of which initiates audible and visible alarm signals in the room or area where sensors are installed, shall be maintained in accordance with Chapter 9.	5307.2.1 Gas detection system. In rooms or areas not operating with ventilation in accordance with Section 5307.2, a gas detection system, complying with the applicable building code or, where approved by the building official, an oxygen depletion alarm system, either of which initiates audible and visible alarm signals in the room or area where sensors are installed, shall be maintained in accordance with Chapter 9.	Changes construction language in the 2018 IFC to maintenance language and adds compliance with the applicable building code.
864	CA	5307.3 Insulated liquid carbon dioxide storage tanks, cylinders, piping and equipment located indoors, in rooms or areas containing storage tanks, cylinders, piping and equipment, and in other areas where a leak of carbon dioxide is expected to accumulate, shall maintain and operate ventilation in accordance with the applicable building code and Section 5004.3 and keep the room containing carbon dioxide at a negative pressure in relation to the surrounding area. Exception: Where a gas detection system was approved in accordance with the applicable building code.	5307.3 Insulated liquid carbon dioxide systems used in beverage dispensing applications. Insulated liquid carbon dioxide systems with more than 100 pounds (45.4 kg) of carbon dioxide used in beverage dispensing applications shall comply with Section 5307.3.1. 5307.3.1 Ventilation. Where required by the applicable building code, insulated liquid carbon dioxide storage tanks, cylinders, piping and equipment are located indoors, rooms or areas containing storage tanks, cylinders, piping and equipment, and other areas where a leak of carbon dioxide is expected to accumulate, shall maintain and operate ventilation in accordance with Section 5004.3 and keep the room containing carbon dioxide at a negative pressure in relation to the surrounding area. Exception: A gas detection system complying with Section 5307.3.2 and the applicable building code shall be permitted in lieu of mechanical ventilation.	Scoping language from the 2018 IFC, not construction Changes construction language from the 2018 IFC to maintenance language and adds compliance with the applicable building code.
865	CAAM	5307.4 Carbon dioxide enrichment systems. The maintenance of carbon dioxide enrichment systems with more than 100 pounds (45.4 kg) of carbon dioxide, and carbon dioxide enrichment systems with any quantity of carbon dioxide having a remote fill connection, shall comply with Sections 5307.4.1 through 5307.4.7.	5307.4 Carbon dioxide enrichment systems. The maintenance of carbon dioxide enrichment systems with more than 100 pounds (45.4 kg) of carbon dioxide, and carbon dioxide enrichment systems with any quantity of carbon dioxide having a remote fill connection, shall comply with Sections 5307.4.1 through 5307.4.7.	Changes construction language from the 2018 IFC to maintenance language and adds compliance with the applicable building code.
866	CA	5307.4.1 Documentation. Where required by the fire code official for an operational permit in accordance with Section 107.2, the following shall be provided: Total aggregate quantity of liquid carbon dioxide in pounds or cubic feet at normal temperature and pressure. 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. Location of containers relative to equipment, building openings and means of egress. Manufacturer's specifications and pressure rating, including cut sheets, of all piping and tubing to be used. A piping and instrumentation diagram that shows piping support and remote fill connections. Details of container venting, including but not limited to vent line size, material and termination location. Alarm and detection system and equipment, if applicable. Seismic support for containers.	5307.4.1 Documentation. The following information shall be provided with the application for permit: Total aggregate quantity of liquid carbon dioxide in pounds or cubic feet at normal temperature and pressure. 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. Location of containers relative to equipment, building openings and means of egress. Manufacturer's specifications and pressure rating, including cut sheets, of all piping and tubing to be used. A piping and instrumentation diagram that shows piping support and remote fill connections. Details of container venting, including but not limited to vent line size, material and termination location. Alarm and detection system and equipment, if applicable. Seismic support for containers.	No changes needed to the 2018 IFC
867	CAAM	5307.4.2 Equipment. Pressure relief, vent piping, fill indicators, fill connections, vent terminations, piping systems and the storage, use and handling of the carbon dioxide shall be maintained in accordance with Chapter 53, the applicable building code and the applicable maintenance provisions of NFPA 55.	5307.4.2 Equipment. Pressure relief, vent piping, fill indicators, fill connections, vent terminations, piping systems and the storage, use and handling of the carbon dioxide shall be maintained in accordance with Chapter 53, the applicable building code and NFPA 55.	Changes construction language from the 2018 IFC to maintenance language and adds compliance with the applicable building code.
868	CAAM	5307.4.3.1 System activation. System activation shall be maintained in accordance with the applicable building code.	5307.4.3.1 System activation. Unless otherwise permitted by the applicable building code, activation of the low-level gas detection system alarm shall be maintained automatically: Stop the flow of carbon dioxide to the piping system. Activate the mechanical exhaust ventilation system. Activate an audible and visible supervisory alarm signal at an approved location within the building. Unless otherwise permitted by the applicable building code, activation of the high-level gas detection system alarm shall automatically: Stop the flow of carbon dioxide to the piping system. Activate the mechanical exhaust ventilation system. 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.	Changes construction language in the 2018 IFC to maintenance language and adds compliance with the applicable building code.
869	CAAM	5307.4.4 Pressurization and ventilation. Rooms or indoor areas in which carbon dioxide enrichment is provided shall be operated and maintained at a negative pressure in relation to the surrounding areas in the building in accordance with the applicable building code.	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 operated in accordance with the applicable building code and maintained to comply with all of the following: Mechanical ventilation in the room or area shall be at a rate of not less than 1 cfm per square foot [0.00508 m <sup>3</sup> /(s • m <sup>2</sup> )]. When activated by the gas detection system, the mechanical ventilation system shall remain on until manually reset. The exhaust system intakes shall be taken from points within 12 inches (305 mm) of the floor. The ventilation system shall discharge to the outdoors in an approved location.	Changes construction language in the 2018 IFC to maintenance language and adds compliance with the applicable building code.
870	CA	5307.4.5 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 area where the carbon dioxide containers are located. The sign shall be not less than 8 inches (200 mm) in width and 6 inches (150 mm) in height and indicate:  CAUTION – CARBON DIOXIDE GAS VENTILATE THE AREA BEFORE ENTERING. A HIGH CARBON DIOXIDE (CO <sub>2</sub> ) GAS CONCENTRATION IN THIS AREA CAN CAUSE ASPHYXIAION.	5307.4.5 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 area where the carbon dioxide containers are located. The sign shall be not less than 8 inches (200 mm) in width and 6 inches (150 mm) in height and indicate:  CAUTION – CARBON DIOXIDE GAS VENTILATE THE AREA BEFORE ENTERING. A HIGH CARBON DIOXIDE (CO <sub>2</sub> ) GAS CONCENTRATION IN THIS AREA CAN CAUSE ASPHYXIAION.	No changes needed to the 2018 IFC
871	CA	5403.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of corrosive materials in amounts not exceeding the maximum allowable quantity per the applicable building code shall be maintained in accordance with Sections 5001, 5003 and 5401.	5403.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of corrosive materials in amounts not exceeding the maximum allowable quantity per control area shall be maintained in accordance with Sections 5001, 5003 and 5401.	Scoping language to instruct the user how to properly use this chapter. The current language removes any such instruction. The proposed language indicates which sections are to be used when quantities are under the MAQ and that quantities over the MAQ should be reviewed by the building official.
872	CAAM	5403.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of corrosive materials in amounts exceeding the maximum allowable quantity per the applicable building code shall be maintained in accordance with this chapter and chapter 50.	5403.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of corrosive materials in amounts exceeding the maximum allowable quantity per control area shall be maintained in accordance with this chapter, chapter 50 and be reviewed by the Building Official for Group H occupancy classification.	
873	CAAM	5404.1.1 Liquid-tight floor. In addition to the provisions of Section 5004.12, floors in storage areas for corrosive liquids shall be maintained as liquid-tight construction in accordance with the applicable building code.	5404.1.1 Liquid-tight floor. In addition to the provisions of Section 5004.12, floors in storage areas for corrosive liquids shall remain as liquid-tight construction in accordance with the applicable building code.	Applies specifically to storage areas for corrosive liquids. Section 5004.12 requires that floors of storage areas must be of noncombustible construction, except for surfacing. This section requires them to be liquid tight, as well.
874	CA	5404.2.1 Above-ground outside storage tanks. Where secondary containment is provided for above-ground outside storage tanks of corrosive liquids, it shall be maintained in accordance with Section 5004.2.2.	5404.2.1 Above-ground outside storage tanks. Where secondary containment is provided for above-ground outside storage tanks of corrosive liquids, it shall be maintained in accordance with Section 5004.2.2.	Clarifies that this section is regarding secondary containment. Such guidance has been removed in the current language. In order to help confine a leak or spill from an outside above-ground storage tank containing corrosive liquids, secondary containment in accordance with Section 5004.2 and the applicable building code must be maintained. This section applies to all outside storage areas with an aggregate tank capacity in excess of 1,000 gallons (3785 L).
875	CAAM	5405.1.2 Ventilation. Where required, mechanical exhaust ventilation shall be maintained and operated in accordance with the applicable building code.	5405.1.2 Ventilation. Where required, mechanical exhaust ventilation shall be maintained and used in accordance with the applicable building code.	Operational and maintenance language is proposed. This section requires mechanical exhaust ventilation for all storage areas containing corrosive liquids with positive vapor pressures, which, if exposed under standard room temperature and atmospheric pressure, give off hazardous fumes and vapors. Adequate mechanical ventilation will reduce the chance for the accumulation of hazardous concentration levels of toxic fumes and vapors. Corrosive liquids without a positive vapor pressure do not readily give off vapors at hazardous concentration levels under normal conditions and, therefore, do not require mechanical exhaust ventilation.
876	CAAM	5503.6 Electrical wiring and equipment. Electrical wiring and equipment shall be maintained in accordance with the applicable provisions of NFPA 70, the applicable building code and Sections 5503.6.1 and 5503.6.2.	5503.6 Electrical wiring and equipment. Electrical wiring and equipment shall be maintained in accordance with NFPA 70, the applicable building code and Sections 5503.7.1 and 5503.7.2.	Restores reference to NFPA 70 and scoping language for the following subsections.
877	CA	5504.2.1 Stationary containers. Stationary containers shall remain in accordance with the applicable building code and comply with the maintenance provisions of this section and those applicable to the type of fluid stored.	5504.2.1 Stationary containers. Stationary containers shall remain in accordance with the applicable building code and comply with the maintenance provisions of this section and those applicable to the type of fluid stored.	Restores technical language removed by the current version. This section acknowledges that requirements will vary depending on the type of fluid being stored.
878	CA	5504.2.1.2 Indoor storage areas. Cryogenic fluids in stationary containers stored indoors shall be stored in buildings, rooms or areas constructed for this use in accordance with the applicable building code.	5504.2.1.2 Indoor storage areas. Cryogenic fluids in stationary containers stored indoors shall be stored in buildings, rooms or areas constructed for this use in accordance with the applicable building code.	Changes construction language to maintenance language in accordance with the applicable building code. This section requires that indoor storage areas be constructed in accordance with the applicable building code. Again, note that all cryogenics do not necessarily have a characteristic that would classify them as hazardous in the context of MAQs.
879	CA			

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500	CA		5504.2.1.3 Ventilation. Storage areas for stationary containers shall be ventilated in accordance with the applicable building code.	Ventilation is more critical for indoor areas than for outdoor areas because the fluids cannot disperse and be removed as easily. This section refers to the applicable building code for the ventilation requirements. Chapter 50 also addresses ventilation requirements in Sections 5003.9 and 5005.2. These particular requirements apply only when the maximum allowable quantities have been exceeded. Further requirements for ventilation and treatment systems, in some cases, are found in the hazard-specific chapters of the code, such as Chapter 60, which addresses highly toxic and toxic materials.
501	CA		5504.2.2.2 Indoor storage areas. Cryogenic fluids in portable containers stored indoors shall only be stored in buildings, rooms or areas constructed for this use in accordance with the applicable building code.	Storage requirements for portable containers. This is not a construction requirement. The use of cryogenics alone may not drive the need for a Group H occupancy. The additional hazard characteristics and amounts of fluids will drive those requirements.
502	CA		5504.2.2.3 Ventilation. Storage areas for portable containers shall be ventilated in accordance with the applicable building code.	Ventilation requirements for portable containers. These requirements are the same as those for stationary containers.
503	CA		5505.4.1.1 Ventilation. Ventilation required by the applicable building code shall be maintained and operated in areas where cryogenic fluids are dispensed. Exception: Cryogenic fluids that can be demonstrated not to create harmful vapors.	Operational and maintenance requirements, not construction. In addition to the basic ventilation requirements for the indoor storage of cryogenics, this section requires that vapors be captured at the source; therefore, special ventilation would be required at the point of fill for the dispensing operation. These ventilation requirements appear to be for normal operation rather than emergency operation.  There is an exception if the amount and type of gas would not be sufficient enough to create a hazardous situation.

## **FP103.2.1 (VFSB SFPC Edit Part 3)-18**

**Proponents:** Andrew Milliken (amilliken@staffordcountyva.gov); SFPC Subworkgroup

**Reason Statement:** This proposal includes items that were reviewed and decided on by the SFPC Edit Workgroup at their 3/17/20, 5/28/20 and 6/11/20 SWG meetings

Proposal approved by Workgroup 2 on 7/1/20

**See attached for specific proposals**

	C	E	F	G
	WG REC	WG AMENDMENTS/MODIFICATIONS	VFSB PROPOSAL	VFSB REASON/COMMENTS
			1201.1 Scope. The provisions of this chapter shall apply to the operation and maintenance of energy systems used for generating or storing energy. It shall not apply to equipment associated with the generation, control, transformation, transmission, or distribution of energy installations that is under the exclusive control of an electric utility or lawfully designated agency.	Adds IFC exemption for utility providers.
286	CA		1201.2 Electrical wiring and equipment. Electrical wiring and equipment used in connection with energy systems shall be maintained in accordance with Chapter 12, NFPA 70 and the applicable building code.	Restores reference to Chapter 12 and NFPA 70.
287	CA		1203.1 General. Emergency power systems and standby power systems shall comply with Sections 1203.1.1 through 1203.1.9.	Restores scoping language.
288	CA	1203.1.2 Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be maintained in accordance with the applicable building code. Fire resistance ratings shall be maintained in accordance with Chapter 7.	1203.1.2 Fuel line piping protection. Fuel lines supplying a generator set inside a high-rise building shall be maintained 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 in accordance with the applicable building code.	Removes construction language.
289	CAAM	1203.1.3 Installation. Emergency power systems and standby power systems shall be approved in accordance with the applicable building code.	1203.1.3 Installation. Emergency power systems and standby power systems shall be installed in accordance with the applicable building code.	Provides a reference to the applicable building code and Building Official for any unapproved installations.
290	CAAM	1203.1.5 Load duration. Emergency power systems and standby power systems shall be maintained to provide the required power for the minimum duration specified in the applicable building code without being refueled or recharged.	1203.1.5 Load duration. Emergency power systems and standby power systems shall be maintained to provide the required power for a minimum duration of 2 hours without being refueled or recharged, unless specified otherwise in the applicable building code.	Restores the number "2" for the amount of hours required. This is an operational requirement that is critical to the successful operation of emergency power systems. In order to properly design emergency and standby power systems, the minimum load duration must be known. This section provides a default minimum 2-hour duration for systems unless another load duration is specified. For instance, emergency responder radio coverage systems are required to provide standby power for 24 hours.
291	CAAM			
292	CA		1203.2.2 Elevators and platform lifts. Standby power shall be maintained for elevators and platform lifts as required in Sections 606.2, 1009.4.1, and 1009.5.	NFPA 72 is the wrong reference standard. The references to these sections are not construction language.
		1203.2.3 Emergency responder radio coverage systems. Standby power shall be maintained for emergency responder radio coverage systems in accordance with Section 510 and the applicable building code. Where specified in the applicable building code, the standby power supply shall be capable of operating the emergency responder radio coverage system at 100 percent system operation capacity for the duration specified in the applicable building code.	1203.2.3 Emergency responder radio coverage systems. Standby power shall be maintained for emergency responder radio coverage systems as required in Section 510 and the applicable building code. Unless otherwise approved by the applicable building code, 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 hours.	Restores reference to standby power requirements for emergency radio coverage systems. Where provided, these systems have always been required to have at least 12 hours of operation on standby power per the USBC. Loss of power is likely during an emergency situation and, in many cases, emergency responders will require the use of their radios for an extended period of time. Note that as it relates to energy systems, standby power is required to operate the radio coverage system for not less than 12 hours.
293	CAAM	1203.2.7 Group I-2 occupancies. Essential electrical systems required by the applicable building code for Group I-2 occupancies shall be maintained in accordance with NFPA 70.	1203.2.7 Group I-2 occupancies. Essential electrical systems for Group I-2 occupancies shall be maintained in accordance with NFPA 70 and the applicable building code.	Changed from "when required by" to "and the"
294	CAAM	1203.2.8 Group I-3 occupancies. Where power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies are operable by a manual release mechanism at the door and emergency power is provided or required by the applicable building code, they shall be maintained.	1203.2.8 Group I-3 occupancies. Power-operated sliding doors or power-operated locks for swinging doors in Group I-3 occupancies shall be operable by a manual release mechanism at the door. Emergency power shall be maintained for the doors and locks in accordance with the applicable building code. Exceptions: 1. Emergency power is not required in facilities where provisions for remote locking and unlocking of occupied rooms in Occupancy Condition 4 are not required as set forth in the applicable building code. 2. Emergency power is not required where remote mechanical operating releases are provided.	Restores the exceptions in the IFC. Not construction requirements.
295	CAAM			
296	CA	1203.2.10 High-rise buildings. Standby power and emergency power shall be maintained for high-rise buildings in accordance with Section 1203 and the applicable building code.	1203.2.10 High-rise buildings. Standby power and emergency power shall be maintained for high-rise buildings in accordance with Section 1203 and the applicable building code.	Restores reference to maintaining standby and emergency power for highrise buildings. This is similar to other special sections above.
297	CAAM	1203.2.13 Laboratory suites. Standby or emergency power shall be maintained for laboratory suites in accordance with Section 1203 and the applicable building code.	1203.2.13 Laboratory suites. Standby or emergency power shall be maintained in accordance with NFPA 70 within laboratory suites in accordance with the applicable building code.	Restores reference to NFPA 70.
298	CAAM	1203.4 Maintenance. Emergency and standby power systems shall be maintained in accordance with NFPA 70, NFPA 110, and NFPA 111 such that the system is capable of supplying service within the time specified for the type and duration required in accordance with the applicable building code.	1203.4 Maintenance. ***Keep IFC language, no amendment needed.	No need for VA amendment. Language matches the 2018 IFC and no longer needs to be a state amendment. Not construction.
299	CA	1203.5 Operational inspection and testing. Emergency power systems, including all appurtenant components, shall be inspected and tested under load in accordance with NFPA 110, NFPA 70, and NFPA 111. Exception: Where the emergency power system is used for standby power or peak load shaving, such use shall be recorded and shall be allowed to be substituted for scheduled testing of the generator set, provided that appropriate records are maintained.	1203.5 Operational inspection and testing. ***Keep IFC language, no amendment needed	No need for VA amendment. Language matches the 2018 IFC and no longer needs to be a state amendment. Not construction.
		1204.2 Access and pathways. Roof access, pathways, and spacing requirements shall be maintained in accordance with the applicable building code. Roof access, pathways, and spacing requirements shall be maintained in accordance with the applicable building code. Pathways shall remain capable of supporting the loads required by the applicable building code. Pathways shall be maintained unobstructed and free from vent pipes, conduit or mechanical equipment unless otherwise approved in accordance with the applicable building code. Exceptions: 1. Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises and similar structures. 2. Roof access, pathways and spacing requirements need not be provided where the fire code official has determined that rooftop operations will not be employed.	1204.2 Access and pathways. Roof access, pathways, and spacing requirements shall be maintained in accordance with the applicable building code. Pathways shall remain capable of supporting fire fighters accessing the roof. Pathways shall be maintained unobstructed and free from vent pipes, conduit or mechanical equipment unless otherwise approved in accordance with the applicable building code. Exceptions: 1. Detached, nonhabitable Group U structures including, but not limited to, detached garages serving Group R-3 buildings, parking shade structures, carports, solar trellises and similar structures. 2. Roof access, pathways and spacing requirements need not be provided where the fire code official has determined that rooftop operations will not be employed.	Revised to maintenance language and not construction. Retains information about an unobstructed path and keeps exceptions for reference.
300	CAAM			
301	CA		1204.2.1 Roof access points. Roof access points shall be maintained in areas that do not require placement of ground ladders over openings such as windows or doors and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires, or signs.	Restores the language from the 2012 VA amendment in 605.11.1.1.
302	CA		1205.1 General. Stationary fuel cell power systems shall be maintained in accordance with this section and the applicable building code.	Scoping language.
		1205.4 Maintenance. Installation of stationary fuel cell power systems shall be approved by the building official and shall be maintained in accordance with the applicable building code, NFPA 70 and NFPA 853, the manufacturer's instructions, and the listing. Stationary fuel cell power systems fueled by hydrogen shall be maintained in accordance with the applicable building code, NFPA 2 and NFPA 70, the manufacturer's installation instructions, and the listing.	1205.5 Residential use. Stationary fuel cell power systems shall not be operated in Group R-3, R-4 and R-5 buildings, or dwelling units associated with Group R-2 buildings unless they are specifically listed for residential use and approved in accordance with the applicable building code.	Provides a reference to the applicable building code and Building Official for any unapproved installations. Systems are listed for both residential and nonresidential use based on the requirements in NFPA 853 and CSA FC1. This section is provided to ensure the appropriate stationary fuel cell power system is installed.
303	CAAM			
304	CA	1205.6 Outdoor installation. Separation required by the applicable building code for outdoor stationary fuel cell power systems shall be maintained 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.	1205.6 Indoor installations. Stationary fuel cell power systems operated in indoor locations shall be specifically listed and labeled for indoor use and comply with the applicable building code. For purposes of this section, an indoor location includes a roof and 50 percent or greater enclosing walls.	Provides reference to the applicable building code and Building Official for any unapproved installations. Systems are listed for either indoor or outdoor use. The 50-percent wall limitation is from NFPA 853, Section 3.3.15.2. This criteria is necessary to differentiate which installations are considered indoor versus outdoor, as the requirements vary. Section 1205.6 specifically addresses indoor installations.
305	CAAM	1205.9 Fuel supply. The fuel supply for stationary fuel cell power systems shall be maintained in accordance with Chapter 53, Chapter 58 and the applicable building code, based on the particular fuel being supplied to the system.	1205.9 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 applicable building code, based on the particular fuel being supplied to the system.	No need for VA amendment. Language in 2018 IFC is for outdoor installations that may not be regulated by the building code.
306	CAAM	1205.10 Manual shutoff. Access to a manual shutoff valves shall not be obstructed. Manual shutoff valves shall be maintained in accordance with the applicable building code.	1205.10 Manual shutoff. Access to a manual shutoff valves shall not be obstructed. Manual shutoff valves shall be located and maintained in accordance with the applicable building code.	Provides reference to the applicable building code, this code and the Building Official for any unapproved installations. This section does not address the fuel supply but instead provides references to the appropriate requirements. The primary fuels are hydrogen and CNG.
307	CAAM			
308	CA	1205.11 Fire suppression. Fire suppression for stationary fuel cell power systems shall be maintained in accordance with Chapter 9 and NFPA 853.	1205.11 Ventilation and exhaust. Ventilation and exhaust for stationary fuel cell power systems shall be operated and maintained in accordance with NFPA 853 and the applicable building code.	Removed construction language and revised to maintenance and operations language.
309	CAAM	1205.12 Gas detection systems. Gas detection systems for stationary fuel cell power systems shall be maintained in accordance with Chapter 9 and the applicable building code.	1205.12 Fire suppression. Fire suppression for stationary fuel cell power system installations shall be maintained in accordance with Chapter 9 and NFPA 853.	Removed construction language and revised to maintenance and operations language.
310	CAAM	1205.13 Gas detection systems. Gas detection systems for stationary fuel cell power systems shall be maintained in accordance with Chapter 9 and the applicable building code. The system shall be maintained to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).	1205.13 Gas detection systems. Gas detection systems for stationary fuel cell power systems shall be maintained in accordance with Chapter 9 and the applicable building code. The system shall be maintained to activate at a flammable gas concentration of not more than 25 percent of the lower flammable limit (LFL).	Removed construction language and revised to maintenance and operations language.
311	CAAM	Delete section	1205.13.1 System activation. Where required by the applicable building code, the activation of the gas detection system shall be maintained to automatically: Close valves between the gas supply and the fuel cell power system. Shut down the fuel cell power system. Initiate local audible and visible alarms in approved locations.	Removed construction language and revised to maintenance and operations language.
312	CAAM	1206.2 Stationary storage battery systems. Stationary storage battery systems having capacities exceeding the values indicated in the applicable building code or technologies not listed therein shall be approved by the Building Official. Stationary storage battery systems shall be maintained in accordance with the applicable building code.	1206.2 Stationary storage battery systems. Stationary storage battery systems having capacities exceeding the values indicated in the applicable building code or technologies not listed therein shall be approved by the Building Official.	Removed construction language and revised to maintenance and operations language.
313	CAAM	1206.2.7 Testing, maintenance and repair. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions and the applicable building code. 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 building official before the replacements are introduced into service.	1206.2.7 Testing, maintenance and repair. Storage batteries and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any storage batteries or system components used to replace existing units shall be compatible with the battery charger, energy management systems, other storage batteries and other safety systems. Introducing other types of storage batteries into the stationary storage battery system or other types of electrolytes into flow battery systems shall be treated as a new installation and require approval by the building official before the replacements are introduced into service.	Restores maintenance and technical language. Provides important direction for new technology and materials to be approved by the building official.
314	CAAM	1206.2.8 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall remain housed in a noncombustible cabinet or other approved enclosure where required by the applicable building code to prevent access by unauthorized personnel.	1206.2.8 Occupied work centers. Where stationary storage batteries are located in an occupied work center, they shall remain housed in a noncombustible cabinet or other approved enclosure in accordance with the applicable building code to prevent access by unauthorized personnel.	Restores operational and maintenance language for occupied work centers.

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315	CA	1206.2.8.7 Outdoor installations. Stationary storage battery systems located outdoors shall be approved in accordance with the applicable building code and maintained in accordance with this Chapter.	1206.2.8.5.1 Cabinets. Unless otherwise required by the applicable building code, where stationary batteries are contained in cabinets in occupied work centers, the cabinet enclosures shall remain located within 10 feet (3048 mm) of the equipment that they support. 1206.2.8.7 Outdoor installations. ***Keep IFC language, no amendment needed	Restores operational and maintenance language for occupied work centers.
316	CAAM	1206.2.8.7.1 Separation. Separation required by the applicable building code for stationary storage battery systems shall be maintained from the following: 1. Lot lines. 2. Public ways. 3. Buildings. 4. Stored combustible materials. 5. Hazardous materials. 6. High-piled stock. 7. Other exposure hazards. Exception: The fire code official is authorized to approve smaller separation distances if large scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures.	1206.2.8.7.1 Separation. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is for outdoor installations that is not regulated by the building code.
317	CAAM	1206.2.8.7.2 Means of egress. Separation distances of outdoor stationary storage battery systems to means of egress required by the applicable building code shall be maintained.	1206.2.8.7.2 Means of egress. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is for outdoor installations that is not regulated by the building code.
318	CAAM	1206.2.8.7.3 Security of outdoor areas. Outdoor areas in which stationary storage battery systems are located shall be secured against unauthorized entry and safeguarded in an approved manner.	1206.2.8.7.3 Security of outdoor areas. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is for outdoor installations that is not regulated by the building code.
319	CA	1206.2.8.7.4 Walk-in units. Where a stationary storage battery system includes an outer enclosure, the unit shall only be entered for inspection, maintenance and repair of batteries and electronics, and shall not be occupied for other purposes.	1206.2.8.7.4 Walk-in units. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is for outdoor installations that is not regulated by the building code.
320	CA	1206.2.9 Maximum allowable quantities. Fire areas within buildings containing stationary storage battery systems exceeding the maximum allowable quantities indicated in the applicable building code, shall comply with the applicable building code requirements for Group H occupancies. Where a maximum allowable quantity is not listed in the applicable building code, quantities must be approved by the building official.	1206.2.9 Maximum allowable quantities. Fire areas within buildings containing stationary storage battery systems exceeding the maximum allowable quantities, as indicated by the applicable building code, shall comply with all applicable Group H occupancy requirements in this code and the applicable building code. Where a maximum allowable quantity is not listed in the applicable building code, quantities must comply with the current USBC requirements.	Revised language to match other sections regarding maximum allowable quantities. Clarifies that where a product is not listed in the applicable building code, quantities must comply with the current USBC.
321	CAAM	1206.2.10 Listings. Where required by the applicable building code, storage batteries and battery storage systems shall be listed. Exception: Lead-acid batteries are not required to be listed.	1206.2.10 Listings. Storage batteries and battery storage systems shall be listed. Exception: Lead-acid batteries are not required to be listed.	Scoping language.
322	CA	1206.2.10.1 Listings. Where required by the applicable building code, storage batteries and battery storage systems shall be listed. Exception: Lead-acid batteries are not required to be listed.	1206.2.10.1 Listings. Storage batteries and battery storage systems shall be listed. Exception: Lead-acid batteries are not required to be listed.	Removes construction language and restores reference to only operating with listed equipment. This section addresses the basic listing requirements for batteries. Basically all storage batteries besides lead-acid must be listed to UL 1973. Prepackaged and pre-engineered systems must be listed in accordance with UL 9540, which includes compliance with UL 1973.
323	CAAM	1206.2.10.2 Prepackaged and preengineered systems. Prepackaged and preengineered stationary storage battery systems shall be maintained in accordance with their listing and the manufacturer's instructions.	1206.2.10.2 Prepackaged and preengineered systems. Prepackaged and preengineered stationary storage battery systems shall be maintained in accordance with their listing and the manufacturer's instructions.	Restores reference to manufacturer's instructions for prepackaged and pre-engineered systems. Pre-engineered and pre-packed systems have been approved more as a system versus components and carry with them listings as a system. This section ensures they are installed in accordance with their listing and the manufacturer's instructions. For instance, if a system were listed for outdoor use only, it cannot be used within a building. Placement within the building would invalidate the listing.
324	CA	1206.2.10.3 Energy management system. Where provided or required by the applicable building code, approved energy management systems for battery technologies other than lead-acid and nickel cadmium shall be operated and maintained within the manufacturer's specifications for monitoring and balancing cell voltages, currents and temperatures. Systems that transmit an alarm signal to an approved location in accordance with the applicable building code if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected, shall be maintained.	1206.2.10.3 Energy management system. Where required by the applicable building code, an approved energy management system shall be operated and maintained 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 be maintained to transmit an alarm signal to an approved location in accordance with the applicable building code if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.	Changed "provided" to "maintained".
325	CAAM	1206.2.10.4 Battery chargers. Unless otherwise required by the applicable building code, battery chargers shall be compatible with the battery chemistry and the manufacturer's electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed preengineered or prepackaged stationary storage battery system.	1206.2.10.4 Battery chargers. Unless otherwise required by the applicable building code, battery chargers shall be compatible with the battery chemistry and the manufacturer's electrical ratings and charging specifications. Battery chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed preengineered or prepackaged stationary storage battery system.	Revised language to ensure product compatibility based on manufacturer's specifications and listing. Using incorrect chargers could create a failure resulting in thermal runaway or potentially fire or explosion. Therefore, specific listing and labeling is required to avoid the possibility of a battery system being charged incorrectly.
326	CA	1206.2.10.5 Inverters. Where required by the applicable building code, inverters shall be listed and labeled in accordance with UL 1741. Only inverters listed and labeled for utility interactive system use and identified as interactive shall be allowed to operate in parallel with the electric utility power system to supply power to common loads.	1206.2.10.5 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.	Operational requirements and guidance back to the applicable building code for use of unlisted equipment. An inverter is an electronic device that is capable of changing direct current (DC) to alternating current (AC). Inverters need to be specifically listed and labeled to avoid using the wrong type, and subsequent system failure. Note that this section also requires a specific listing for utility interactive systems. These types of inverters allow things like automatic transfer to enable the stationary storage battery system to feed power back into the commercial power grid, or disconnect from the commercial grid when it is supposed to be de-energized due to an outage. These types of inverters must be inspected by the local electrical inspector and the power utility in most cases.
327	CAAM	1206.2.10.6 Safety caps. Flame-arresting safety caps for vented batteries, provided or required in accordance with the applicable building code shall be maintained.	1206.2.10.6 Safety caps. Vented batteries shall be maintained with flame-arresting safety caps.	Removed construction language and revised to maintenance requirements. The types of batteries regulated by this section vent hydrogen and oxygen to the atmosphere. There are two types of vented batteries: nonrecombinant and recombinant. Essentially, a nonrecombinant battery is a storage battery in which, under conditions of normal use, hydrogen and oxygen gases created by electrolysis are vented into the air outside of the battery. A recombinant battery is a storage battery in which, under conditions of normal use, most of the hydrogen and oxygen gases created by electrolysis are converted back into water inside the battery instead of venting into the air.  Another term used for nonrecombinant batteries is "flooded" or "vented." Other terms used to denote recombinant batteries are "valve regulated" or "valve-regulated lead-acid (VRLA)." Flooded batteries vent regularly whereas valve-regulated batteries vent when the internal pressure exceeds the design pressure of their self-sealing vents, which are an integral part of their design. In case of either flooded or VRLA cells, flame-arresting vents are needed to prevent a static spark (or other flame source) outside the battery from propagating to the interior of the battery where oxygen or hydrogen may have accumulated during normal operation of the battery.
328	CAAM	1206.2.10.7 Thermal runaway. Storage batteries provided with a listed device or other approved method to prevent, detect and control thermal runaway in accordance with the applicable building code shall be maintained.	1206.2.10.7 Thermal runaway. Where required by the applicable building code, storage batteries shall maintain a listed device or other approved method to prevent, detect and control thermal runaway.	Removed construction language and provided reference to the applicable building code. Under certain extreme conditions of high ambient temperature or charging rate, or due to internal partial shorting in cells, VRLA batteries may experience a phenomenon known as "thermal runaway." This is a condition that occurs in a battery (especially valve-regulated types) when charging energy results in heat generation within the battery greater than the heat dissipated, causing an uncontrolled rise in battery temperature. Under these conditions, a battery may generate excessive heat that can cause failure through cell dryout or, in rare cases, rupture or melting of the battery. The thermal runaway management system and batteries are commonly listed in accordance with UL 1988.
329	CAAM	1206.2.10.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall comply with Chapter 60 and the applicable building code.	1206.2.10.8 Toxic and highly toxic gas. Stationary storage battery systems that have the potential to release toxic and highly toxic gas during charging, discharging and normal use conditions shall comply with Chapter 60 and the applicable building code.	Revised language to reference the applicable building code. This section covers battery technologies (many yet to hit the market) that may potentially 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. Hydrogen and oxygen produced by vented batteries are not considered toxic or highly toxic gases.
330	CA	1206.2.11 Fire-extinguishing and detection systems. Fire-extinguishing and detection systems shall be maintained in accordance with Chapter 9 and the applicable building code.	1206.2.11 Fire-extinguishing, detection, and ventilation systems. Fire-extinguishing and detection systems shall be maintained in accordance with Chapter 9 and the applicable building code.	Removed construction language and consolidated requirements from multiple subsections to be maintenance language for a single code section. This section provides maintenance requirements for fire-extinguishing and detection systems for battery systems. This section also provides operation requirements for features that address the hazards of the release of flammable gases such as hydrogen and potential spills. The requirements may vary based on the type of battery system used. For instance, batteries with immobilized liquid versus those with free-flowing electrolyte require different ways to address spills and neutralization, as one is more prone to a larger spill than the other.
331	CAAM	1206.2.11.3 Ventilation. Ventilation of rooms containing stationary storage battery systems shall be operated and maintained in accordance with the applicable building code. Where cabinets contain storage batteries and are located in occupied spaces are required by the applicable building code to be provided with ventilation, the ventilation shall be operated and maintained. Where supervision of ventilation systems is provided or required by the applicable building code, it shall be maintained.	1206.2.11.3 Ventilation. Ventilation of rooms containing stationary storage battery systems shall be operated and maintained in accordance with the applicable building code. Where cabinets contain storage batteries and are located in occupied spaces, the cabinet shall be provided with ventilation in accordance with the applicable building code. Where provided, supervision of ventilation systems shall be maintained in accordance with the applicable building code.	Removed construction language and consolidated requirements from multiple subsections to be maintenance language for a single code section. This section provides maintenance requirements for fire-extinguishing and detection systems for battery systems. This section also provides operation requirements for features that address the hazards of the release of flammable gases such as hydrogen and potential spills. The requirements may vary based on the type of battery system used. For instance, batteries with immobilized liquid versus those with free-flowing electrolyte require different ways to address spills and neutralization, as one is more prone to a larger spill than the other.

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332	CA	1206.2.11.5 Spill control and neutralization. Where required by Section 1206.2.12, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing stationary storage batteries as follows: 1. For batteries with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0. 2. For batteries with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.	1206.2.11.5 Spill control and neutralization. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. Spill control and neutralization is required by Section 1206.2.12 for several types of battery technologies, including: Lead-acid storage batteries. Nickel-cadmium batteries. PbSe batteries. Note that Section 1206.2.12.6 identifies the need for spill control and neutralization for other battery technologies. The need for this may vary based on the technology. Batteries that contain a free-flowing liquid electrolyte pose the same containment problems as any other corrosive liquid hazardous material, but the containment and neutralization provisions in this section are performance based and neither specifically require spill control in the form of containment nor a specific method of neutralization. The quantity of neutralization material required to be available would be greater for these less viscous electrolytes; however, because of their mobility and the rapidity with which they can spread and the potential scope of the spread, Item 1 deals with batteries that contain free-flowing electrolyte. The requirement is fairly performance based and does not specifically require spill control in the form of containment, nor a specific method of neutralization. Instead, it states that a capability must be available to control and neutralize a spill equal to the liquid content of the largest single battery cell or block (not the whole battery) to a pH between 5.0 and 9.0. In the case of flooded lead-acid batteries, this may require initial absorption or containment followed by neutralization. Batteries with immobilized electrolyte, such as VRLA batteries, are required to comply with Item 2. This item is also performance based and does not specifically require spill control in the form of containment, nor a specific method of neutralization. Instead, it states that a capability must be available to control and neutralize a spill equal to 3 percent of the liquid content of the largest single battery cell or block (not the whole battery) housed in the battery room to a pH between 5.0 and 9.0. Typically, either sodium bicarbonate powder or an ammonia-based liquid buffering solution is provided within the room where lead-acid battery systems are located for use by trained personnel (NICO battery installations will typically have on hand a dilute solution of boric acid for neutralizing the alkaline potassium hydroxide electrolyte solution). The electrolyte in VRLA batteries is immobilized by either the addition of a gelling agent or by being absorbed in a fiberglass mat (i.e., a sponge). This immobilization creates a situation where a spill of the electrolyte is highly unlikely. A typical accident where a VRLA battery case is broken results in a slight drip or a slow ooze of material out of the battery that cannot be characterized as a spill.
333	CA	1206.2.12 Specific battery-type requirements. This section includes requirements applicable to specific types of storage batteries. Stationary storage battery systems with more than one type of storage battery shall comply with requirements applicable to each battery type.	1206.2.12 Specific battery-type requirements. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. This section deals with specific requirements based on the different types of battery technologies. This section is referenced in many cases in Section 1206.2 to determine which provisions are applicable. For example, spill control and neutralization are only applicable to some battery technologies such as lead acid batteries. 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.
334	CA	1206.2.12.1 Lead-acid storage batteries. Stationary storage battery systems utilizing lead-acid storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11 Spill control and neutralization shall be in accordance with Section 1206.2. Thermal runaway protection shall be maintained for valve-regulated lead-acid (VRLA) storage batteries in accordance with Section 1206.2.10.7. The signage in Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.	1206.2.12.1 Lead-acid storage batteries. Stationary storage battery systems utilizing lead-acid storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11 Spill control and neutralization shall be in accordance with Section 1206.2. Thermal runaway protection shall be maintained for valve-regulated lead-acid (VRLA) storage batteries in accordance with Section 1206.2.10.7. The signage in Section 1206.2.8.6 shall indicate the room contains lead-acid batteries.	Removed construction language and revised to maintenance and operations language. Lead-acid batteries were regulated previously by the code and the provisions are consistent with the nature of the hazard. Ventilated lead-acid batteries are a type of battery that typically requires spill control and neutralization. They also generate hydrogen and oxygen during charging; therefore, ventilation is necessary. Nickel-cadmium batteries are treated similarly.
335	CA	1206.2.12.2 Nickel-cadmium (Ni-Cd) storage batteries. Stationary storage battery systems utilizing nickel-cadmium (Ni-Cd) storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. Thermal runaway protection shall be provided for valve-regulated sealed nickel-cadmium storage batteries in accordance with Section 1206.2.10.7. The signage in Section 1206.2.8.6 shall indicate the room contains nickel-cadmium batteries.	1206.2.12.2 Nickel-cadmium (Ni-Cd) storage batteries. Stationary storage battery systems utilizing nickel-cadmium (Ni-Cd) storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. Thermal runaway protection shall be provided for valve-regulated sealed nickel-cadmium storage batteries in accordance with Section 1206.2.10.7. The signage in Section 1206.2.8.6 shall indicate the room contains nickel-cadmium batteries.	Removed construction language and revised to maintenance and operations language. The provisions for nickel-cadmium batteries were regulated previously by the code and the provisions are consistent with the nature of the hazard. Ventilated nickel-cadmium batteries are one of the types of batteries that typically require spill control and neutralization. They also generate hydrogen and oxygen during charging; therefore, ventilation is necessary. They are treated very similarly to lead-acid batteries.
336	CA	1206.2.12.3 Lithium-ion storage batteries. The signage in Section 1206.2.8.6 shall indicate the type of lithium batteries contained in the room.	1206.2.12.3 Lithium-ion storage batteries. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. Lithium-ion batteries only have provisions specific to signage, as many of the specific requirements such as ventilation, spill control and neutralization do not apply to such technology. Instead the primary provisions are those that apply to the size of battery arrays, separation, fire-extinguishing systems and smoke detection.
337	CA	1206.2.12.4 Sodium-beta storage batteries. Stationary storage battery systems utilizing sodium-beta storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. The signage in Section 1206.2.8.6 shall indicate the type of sodium batteries in the room and include the instructions, "APPLY NO WATER."	1206.2.12.4 Sodium-beta storage batteries. Stationary storage battery systems utilizing sodium-beta storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. The signage in Section 1206.2.8.6 shall indicate the type of sodium batteries in the room and include the instructions, "APPLY NO WATER."	Removed construction language and revised to maintenance and operations language. Sodium beta storage batteries require ventilation due to the concern with the production of hydrogen. In addition, these batteries contain sodium, and thus are potentially water reactive and shouldn't normally be protected with an automatic sprinkler system. Some sodium-based battery systems have designs such that metallic sodium as a separate element will never exist in a case where it could be exposed to water, and thus these types of batteries could potentially be installed in a sprinklered space. The signage requirements make both the occupants and emergency responders aware.
338	CA	1206.2.12.5 Flow storage batteries. Stationary storage battery systems utilizing flow storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. The signage required in Section 1206.2.8.6 shall indicate the type of flow batteries in the room.	1206.2.12.5 Flow storage batteries. Stationary storage battery systems utilizing flow storage batteries shall be maintained in accordance with the applicable building code and the following: Ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. The signage required in Section 1206.2.8.6 shall indicate the type of flow batteries in the room.	Removed construction language and revised to maintenance and operations language. Flow batteries use two different chemicals dissolved in liquids separated by a membrane. These batteries have the possibility of releasing hydrogen and therefore require ventilation. Spill control and neutralization must be addressed as there are liquids involved in these types of batteries. There are various combinations of chemicals used; therefore, the signage requirements note that the type of flow batteries needs to be indicated. One such combination is hydrogen-lithium bromate.
339	CA	1206.2.12.6 Other battery technologies. Stationary storage battery systems utilizing battery technologies other than those described in Sections 1206.2.12.1 through 1206.2.12.5 shall be maintained in accordance with the applicable building code and the following: Gas detection systems shall be provided where required by the applicable building code and maintained in accordance with Chapter 9. Mechanical ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. In addition to the signage required in Section 1206.2.8.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate that the room contains energized electrical circuits.	1206.2.12.6 Other battery technologies. Stationary storage battery systems utilizing battery technologies other than those described in Sections 1206.2.12.1 through 1206.2.12.5 shall be maintained in accordance with the applicable building code and the following: Gas detection systems shall be provided where required by the applicable building code and maintained in accordance with Chapter 9. Mechanical ventilation shall be operated and maintained in accordance with Section 1206.2.11. Spill control and neutralization shall be in accordance with Section 1206.2. In addition to the signage required in Section 1206.2.8.6, the marking shall identify the type of batteries present, describe the potential hazards associated with the battery type, and indicate that the room contains energized electrical circuits.	Critical section regarding maintenance and operations of "other battery technologies". Removed construction language and revised to maintenance and operations language. Technology associated with battery systems is rapidly evolving. This section addresses batteries that are not specifically addressed by the provisions of Section 1206.2. This section covers all elements that may be necessary such as gas detection where such batteries have the potential to produce toxic and highly toxic gases. Ventilation is required and since liquid is involved, spill control and neutralization is needed. The signage required in Item 4 is more detailed than that required by Section 1206.2.8.6 because occupants and first responders may be unfamiliar with the technology and its associated hazards.
340	CA	1206.3.2.6 Outdoor installation. Capacitor energy systems located outdoors shall be approved in accordance with the applicable building code and maintained in accordance with this Chapter. 1206.3.2.6.1 Separation. Separation required by the applicable building code for capacitor energy systems shall be maintained from the following: 1. Lot lines. 2. Public ways 3. Buildings. 4. Stored combustible materials. 5. Hazardous materials. 6. High-piled stock. 7. Other exposure hazards. Exception: The fire code official is authorized to approve lesser separation distances if large-scale fire and fault condition testing conducted or witnessed and reported by an approved testing laboratory is provided showing that a fire involving the system will not adversely impact occupant egress from adjacent buildings, or adversely impact adjacent stored materials or structures. 1206.3.2.6.2 Means of egress. Separation distances of capacitor energy systems to means of egress required by the applicable building code shall be maintained. 1206.3.2.6.3 Security of outdoor areas. Outdoor areas in which capacitor energy storage systems are located shall be secured against unauthorized entry and safeguarded in an approved manner. 1206.3.2.6.4 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 capacitors and electronics, and shall not be occupied for other purposes.	1206.3.2.6 through 1206.3.2.6.4 ***Keep IFC language, no amendments needed	No need for VA amendment. Language in 2018 IFC is for outdoor installations that is not regulated by the building code.
341	CAAM	1206.3.3 Maximum allowable quantities. Fire areas within buildings containing capacitor energy storage systems that exceed the maximum energy capacity indicated in the applicable building code, shall comply with the applicable building code requirements for Group H occupancies. Where a maximum energy capacity is not listed in the applicable building code, quantities must be approved by the building official.	1206.3.3 Maximum allowable quantities. Fire areas within buildings containing capacitor energy storage systems that exceed 600 kWh of energy capacity shall comply with the applicable building code and Group H occupancy requirements in this code.	Scoping language, not construction.
342	CAAM	1206.3.4 Capacitors and equipment. The operation and maintenance of capacitor energy storage systems and related equipment shall comply with Sections 1206.3.4.1 through 1206.3.4.5.	1206.3.4 Capacitor energy storage systems. Capacitor energy storage systems having capacities exceeding 3 kWh (10.8 megajoules) shall comply with Sections 1206.3 through 1206.3.2.6.1. Exception: Capacitors regulated by NFPA 70, Chapter 460, and capacitors included as a component part of other listed electrical equipment are not required to comply with this section.	Scoping language.
343	CA	1206.3.4.1 Listing. Where required by the applicable building code, capacitors and capacitor energy storage systems shall be listed in accordance with the applicable building code.	1206.3.4.1 Listing. Capacitors and capacitor energy storage systems shall be listed in accordance with the applicable building code.	Removed construction language and revised to reference the applicable building code.
344	CAAM	1206.3.4.2 Prepackaged and preengineered systems. In addition to other applicable requirements of this code, prepackaged and preengineered capacitor energy storage systems shall be maintained in accordance with their listing and the manufacturer's instructions.	1206.3.4.2 Prepackaged and preengineered systems. In addition to other applicable requirements of this code, prepackaged and preengineered capacitor energy storage systems shall be maintained in accordance with their listing and the manufacturer's instructions.	Removes construction language and reference to manufacturer's instructions.
345	CA	1206.3.4.3 Energy management system. Where provided or required by the applicable building code, approved energy management systems shall be operated and maintained within the manufacturer's specifications for monitoring and balancing cell voltages, currents and temperatures. Systems that transmit an alarm signal to an approved location in accordance with the applicable building code if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected, shall be maintained.	1206.3.4.3 Energy management system. Where required by the applicable building code, an approved energy management system shall be operated and maintained for monitoring and balancing capacitor voltages, currents and temperatures within the manufacturer's specifications. Where required by the applicable building code, the system shall transmit an alarm signal to an approved location if potentially hazardous temperatures or other conditions such as short circuits, over voltage or under voltage are detected.	Removes construction language and revised with operations and maintenance language.
346	CAAM	1206.3.4.4 Capacitor chargers. Capacitor chargers shall be compatible with the capacitor manufacturer's electrical ratings and charging specifications. Capacitor chargers shall be listed and labeled in accordance with UL 1564 or provided as part of a listed preengineered or prepackaged capacitor energy storage system.	1206.3.4.4 Capacitor chargers. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. Using incorrect chargers could create a failure resulting in thermal runaway or potentially fire or explosion. Therefore, specific listing and labeling is required to avoid the possibility of a capacitor energy storage system being charged incorrectly.
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348	CA	1206.3.4.5 Toxic and highly toxic gas. Capacitor energy storage systems that have the potential to release toxic and highly toxic materials during charging, discharging and normal use conditions shall comply with Chapter 60.	1206.3.4.5 Toxic and highly toxic gas. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. This section covers capacitor energy storage technologies (many yet to hit the market) that may potentially produce toxic gases during charging, discharging and normal use, and triggers Chapter 60 safety requirements. There is no intent to address capacitor energy systems that produce toxic gases during fires or abnormal conditions.
349	CAAM	1206.3.5 Fire-extinguishing and detection systems. Fire-extinguishing and smoke detection systems provided or required by the applicable building code in capacitor energy storage system rooms shall be maintained in accordance with Chapter 9.	1206.3.5 Fire-extinguishing and detection systems. Fire-extinguishing and smoke detection systems shall be maintained to ensure proper operation in capacitor energy storage system rooms.	Removes construction language and provides maintenance reference to Chapter 9.
349	CAAM	1206.3.5.3 Ventilation. Ventilation of rooms containing capacitor energy storage systems shall be operated and maintained in accordance with the applicable building code. Where supervision of ventilation systems is provided or required by the applicable building code, it shall be maintained.		
349	CAAM	1206.3.5.4 Spill control and neutralization. Where capacitors contain liquid electrolyte, approved methods and materials shall be provided for the control and neutralization of spills of electrolyte or other hazardous materials in areas containing capacitors as follows: 1. For capacitors with free-flowing electrolyte, the method and materials shall be capable of neutralizing a spill of the total capacity from the largest cell or block to a pH between 5.0 and 9.0. 2. For capacitors with immobilized electrolyte, the method and material shall be capable of neutralizing a spill of 3.0 percent of the capacity of the largest cell or block in the room to a pH between 5.0 and 9.0.	1206.3.5.4 Spill control and neutralization. ***Keep IFC language, no amendment needed	No need for VA amendment. Language in 2018 IFC is maintenance and operations requirements. This section only applies to capacitor energy storage systems that have liquid electrolyte. There are two types, either free flowing or immobilized. The two items deal with both types of electrolyte conditions.  Capacitors that contain a free-flowing liquid electrolyte pose the same containment problems as any other corrosive liquid hazardous material, but the containment and neutralization provisions in this section are performance based and neither specifically require spill control in the form of containment nor a specific method of neutralization. The quantity of neutralization material required to be available would be greater for these less-viscous electrolytes, however, because of their mobility and the rapidly and potential scope of the spread.  Item 1 deals with capacitors that contain free-flowing electrolyte. The requirement is fairly performance based and neither specifically requires spill control in the form of containment, nor a specific method of neutralization. Instead, it states that a capability to control and neutralize a spill equal to the liquid content of the largest single cell or block to a pH between 5.0 and 9.0 must be available.  Capacitors with immobilized electrolyte are required to comply with Item 2. This item is also performance based and neither specifically requires spill control in the form of containment, nor a specific method of neutralization. Instead, it states that a capability to control and neutralize a spill equal to the 3 percent of the liquid content of the largest single cell or block housed to a pH between 5.0 and 9.0 must be available. Typically, either sodium-bicarbonate powder or a liquid buffering solution is provided within the room where the capacitor system is located for use by trained personnel.
350	CA	1206.3.6 Testing, maintenance and repair. Capacitors and associated equipment and systems shall be tested, maintained and repaired in accordance with the manufacturer's instructions and the applicable building code.	1206.3.6 Testing, maintenance and repair. Capacitors and associated equipment and systems shall be tested and maintained in accordance with the manufacturer's instructions. Any capacitors or system components used to replace existing units shall be compatible with the capacitor charger, energy management systems, other capacitors, and other safety systems. Introducing different capacitor technologies into the capacitor energy storage system shall be treated as a new installation and require approval by the building code official before the replacements are introduced into service.	Changes "fire code official" to "building code official" for approval of new installations. This section is critical to the long-term safe and effective use of the capacitor energy storage system. This section provides the mechanism to enable such systems to be tested and maintained. More importantly, it requires that any time a different capacitor technology is being used with an existing capacitor energy storage system, that it be addressed as if it were new. This would require a full review of the requirements in Section 1206.3.
351	CAAM	2106.3 Class II and III solvents. Scouring, brushing, and spotting and pretreating shall be permitted to be conducted with Class II or III solvents. The maximum quantity of Class II or III solvents permitted at any work station shall be 1 gallon (4 L). In other than Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the maximum allowable quantity per control area for use-open system in accordance with the applicable building code.	2106.3 Class II and III solvents. Scouring, brushing, and spotting and pretreating shall be permitted to be conducted with Class II or III solvents. The maximum quantity of Class II or III solvents permitted at any work station shall be 1 gallon (4 L). In other than Group H-2 occupancy, the aggregate quantities of solvents shall not exceed the maximum allowable quantity per control area for use-open system.	The reference to MAQ is appropriate and important to keep in this section. This section allows Class II or III solvents to be used for spotting or pretreating and limits the quantity of solvent that can be in use at a spotting or pretreating work station to 1 gallon (4 L) to reduce the likelihood of an unmanageable solvent spill. Aggregate quantities of spotting or pretreating solvent must not exceed the MAQ for open system use established by Table 5003.1.(1), including the increases allowed for the sprinkler system required by Section 2108.2.
351	CAAM	2108.2 Automatic sprinkler systems required or provided for dry cleaning plants containing Type II, III-A, or III-B dry cleaning systems shall be maintained in accordance with Chapter 9. Where special conditions were required by the applicable building code, in order to not install an automatic sprinkler system, those conditions shall be maintained.	2108.2 Unless otherwise required by the applicable building code, the following operational conditions are to be maintained in the absence of an automatic sprinkler system: 1. Type III-A dry cleaning plants where the aggregate quantity of Class III-A solvent in dry cleaning machines and storage does not exceed 330 gallons (1250 L) and dry cleaning machines are equipped with a feature that will accomplish any one of the following: 1.1. Prevent oxygen concentrations from reaching 8 percent or more by volume. 1.2. Keep the temperature of the solvent at least 30°F (16.7°C) below the flash point. 1.3. Maintain the solvent vapor concentration at a level lower than 25 percent of the lower explosive limit (LEL). 1.4. Utilize equipment approved for use in Class I, Division 2 hazardous locations in accordance with NFPA 70. 1.5. Utilize an integrated dry-chemical, clean agent or water-mist automatic fire-extinguishing system designed in accordance with Chapter 9. 2. Type III-B dry cleaning plants where the aggregate quantity of Class III-B solvent in dry cleaning machines and storage does not exceed 3,300 gallons (12,490 L).	Maintenance of sprinkler systems is covered by 2108.1 and Chapter 9. This section provided specific operational conditions that must be maintained if used in lieu of fire sprinklers. Several exceptions to the requirement for sprinklers are included in this section of the code in part because several states have banned the use of the nonflammable dry cleaning fluid perchloroethylene or "perc" due to its carcinogenicity which already requires that plant operators purchase new equipment using alternative dry cleaning technology. The ICC voting membership approved the addition of the exceptions because its members felt that having a sprinkler requirement on top of that capital expense would be a business hardship and also because the nationally recognized standard, NFPA 32, already included such exceptions. <b>These exceptions were added to the code rather than relying on a reference to NFPA 32 so the inspector would not have to carry the referenced standard into the field.</b>
355	CAAM	2306.2.4.1 Tank capacity limits. The individual and aggregate capacity of tanks storing Class I and Class II liquids at an individual site shall be limited to the quantities allowed in the applicable building code.	2306.2.4.1 Tank capacity limits. The individual and aggregate capacity of tanks storing Class I and Class II liquids at an individual site shall be limited to the quantities allowed in the applicable building code.	Literature review shows that these particular thresholds (15,000 gallons and aggregate 48,000 gallons) have not changed since at least the 2000 IFC.
376	CA	2306.2.4.2 Fleet vehicle motor fuel-dispensing facilities. The individual capacity and aggregate capacity of tanks storing Class II and Class IIIA liquids at a fleet vehicle motor fuel-dispensing facility shall be limited to the quantities allowed in the applicable building code.	2306.2.4.2 Fleet vehicle motor fuel-dispensing facilities. The individual capacity and aggregate capacity of tanks storing Class II and Class IIIA liquids at a fleet vehicle motor fuel-dispensing facility shall be limited to the quantities allowed in the applicable building code.	Literature review shows that these particular thresholds (20,000 gallons and aggregate 80,000 gallons) have not changed since at least the 2000 IFC.
377	CA	3105.1 General. Operation and maintenance of temporary stage canopies shall be in accordance with Section 3104, Section 3105.2 through 3105.7, and ANSI E1.21.	3105.1 General. Temporary special event structures shall comply with Sections 3104, 3105.2 through 3105.9 and ANSI E1.21	This is new language for the 2018 IFC which defines a temporary special event structure as one that is not regulated by the building code.
384	CAAM	3105.2 Approval. Temporary stage canopies in excess of 400 square feet (37 m <sup>2</sup> ) shall not be erected for any purpose without first obtaining approval and a permit from the building official.	3105.2 Approval. Temporary special event structures in excess of 400 square feet (37 m <sup>2</sup> ) shall not be erected, operated or maintained for any purpose without first obtaining approval and a permit from the fire official and the building official.	The 2015 VSFFPC removes fire official approval authority. This was never the intent of the IFC. This section of the IFC requires that both the fire code official and the building official issue a permit to construct a special event structure where the structure exceeds 400 square feet in area. This provides coordination of the respective expertise of the fire code official and the building official. This encourages teamwork and cooperation. The current VSFFPC language does not.
385	CAAM	3105.3 Permits shall be required as set forth in section 107.2	3105.3 Permits shall be required as set forth in section 107.2	Sections 105.6 and 105.7 do not exist in the 2015 VSFFPC. This proposal, although doesn't add a new permit, provides the correct reference for future use or those localities that add such a permit.
386	CA	3105.5 Required documents. Documents shall be submitted to the building official where required by the USBC.	3105.5 Required documents. The following documents shall be submitted to the fire official for approval: 1. Designation of responsible party. The owner of the temporary special event structure shall designate in writing a person to have responsibility for the temporary special event structure on the site. The designated person shall have sufficient knowledge of the construction documents, manufacturer's recommendations and operations plan to make judgments regarding the structure's safety and to coordinate with the fire code official. 2. Operations plan: The operations plan shall reflect manufacturer's operational guidelines, procedures for environmental monitoring and actions to be taken under specified conditions consistent with the construction documents. NOTE: Construction documents shall be submitted to the building official where required by the USBC.	The proposed language removes the construction language (originally item 1) and leaves the operational items as indicated in the 2018 IFC. The operations plan must identify the responsible person, designate safe evacuation routes and locations, and evaluate the potential for cancelling the show when the weather creates an unsafe condition.
391	CAAM	3105.6 Inspections. Inspections shall comply with Section 106 and Sections 3105.6.1 and 3105.6.2.		
391	CAAM	3105.6.1 Independent inspector. The owner of a temporary stage canopy shall employ a qualified, independent approved agency or individual to inspect the installation of a temporary stage canopy.		
391	CAAM	3105.6.2 Inspection report. The inspecting agency or individual shall furnish an inspection report to the building official and fire code official. The inspection report shall indicate that the temporary stage canopy was inspected and was or was not installed in accordance with the approved construction documents. Discrepancies shall be brought to the immediate attention of the installer for correction. Where any discrepancy is not corrected, it shall be brought to the attention of the building official and fire code official and the designated responsible party.	3105.6.2 Inspection report. The inspecting agency or individual shall furnish an inspection report to the building official and fire code official. The inspection report shall indicate that the temporary special event structure was inspected and was or was not installed in accordance with the approved construction documents. Discrepancies shall be brought to the immediate attention of the installer for correction. Where any discrepancy is not corrected, it shall be brought to the attention of the building official and fire code official and the designated responsible party.	No content change other than "Temporary stage canopy" to "Temporary special event structure"
391	CAAM	3105.7 Means of egress. The means of egress for temporary stage canopies shall comply with Chapter 10 and the applicable building code.	3105.7 Means of egress. The means of egress for temporary special event structure shall comply with Chapter 10 of the International Fire Code.	See item 3104.14 above regarding how "applicable building code" ultimately references back to the IFC. These are temporary facilities only and often do not include a specific occupant load or occupancy permit from the building official.
391	CAAM	Deleted	3105.8 Location. Temporary stage canopies shall be located a distance from property lines and buildings to accommodate guy wires, cross-bracing, ground anchors or ballast. Location shall not interfere with egress from a building or encroach on fire apparatus access roads in accordance with this code.	This is a critical operational section for coordination between structural requirements, emergency access and fire separation. Separation distance requirements of this section are consistent with requirements for conventional structures, especially those that could represent an above-average fire hazard. A fire of any size within a temporary stage structure would almost certainly involve any membrane coverings and structural support elements. Because the support ropes and ground anchors are under tension, particularly with large structures, a structure weakened by fire would likely fail, causing the ropes or wires to recoil and possibly pull portions of the burning temporary stage structure out of its original position. Requiring clear space around the structure helps reduce the likelihood that burning membrane sections and flying embers would endanger other structures or interfere with the functions of the open space, which include providing a clear egress path from the stage canopy or any structure adjacent to it and fire department access to the structure.
391	CAAM	3901.1 Scope. Plant processing or extraction facilities shall comply with this chapter and the applicable building code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transferring and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the applicable building code.	3901.1 Scope. Plant processing or extraction facilities shall comply with this chapter and the applicable building code. The extraction process includes the act of extraction of the oils and fats by use of a solvent, desolventizing of the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery. The use, storage, transferring and handling of hazardous materials in these facilities shall comply with this chapter, other applicable provisions of this code and the applicable building code.	Changes International Building Code to applicable building code. This section establishes the scope of Chapter 38 with respect to the use of solvents for the processing and extraction of fats and oils from plants. The requirements in Chapters 50, 53, 57, 58 and 61 must also be complied with where applicable. These provisions are intended to provide a roadmap on the use of the code to address a process not traditionally seen as a hazardous process, but where the risks are such that special attention must be made to address the risks.
705	CAAM			

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726	CA	3901.3 Permits. Permits shall be required as set forth in Section 107.2.	3901.3 Permits. Permits shall be required as set forth in Section 107.2.	Changed reference to Section 107.2 (ensure that a new permit is added in 107.2).
727	CAAM	3903.1 Locations. Processing located in a building shall be maintained in accordance with the applicable building code.	3903.1 Locations. Processing located in a building shall be maintained in accordance with the applicable building code and the International Fire Code.	There is NO code section in the VCC or IBC that clearly addresses this type of process. Processes are not regulated by the Building Official. As many processing and extraction facilities are "cottage industries" or are part of a new start-up industry. Adds the "applicable building code"
728	CA	3903.4.1 Industrial ovens. The use of industrial ovens shall comply with the applicable building code and Chapter 30.	3903.4.1 Industrial ovens. The use of industrial ovens shall comply with the applicable building code and Chapter 30.	
729	CAAM	3904.1 General requirements. Systems and equipment used with the processing and extraction of oils and products from plants shall comply with Sections 3904.2 through 3904.4, Chapter 50, other applicable provisions of this code and the applicable building code.	3904.1 General requirements. Systems and equipment used with the processing and extraction of oils and products from plants shall comply with Sections 3904.2 through 3904.4 and Chapter 50, and other applicable provisions of this code and the applicable building code.	Added the term "applicable building code". There are no requirements in the IBC or VCC for these type of systems. Devices used in processing or extraction are to meet the requirements of Sections 3904.2 through 3904.4, and Section 5003.2. The provisions found within Section 3904 recognize that many of the systems and equipment are not typically listed and, therefore, specific requirements are necessary.
730	CAAM	3905.1 Gas detection. Continuous gas detection system provided in accordance with the applicable building code for extraction processes utilizing flammable gases as solvents shall be maintained as approved. The gas detection threshold shall be not greater than 25 percent of the lower explosive limit/lower flammability limit (LEL/LFL) of the materials, unless otherwise approved in accordance with the applicable building code.	3905.1 Gas detection. For extraction processes utilizing flammable gases as solvents, a continuous gas detection system shall be maintained as approved. The gas detection threshold shall be not greater than 25 percent of the lower explosive limit/lower flammability limit (LEL/LFL) of the materials.	Revised this section to operations and maintenance language. Where a flammable gas is used as a solvent, a continuous gas detection system shall be provided. To prevent any accidental or planned release of flammable gases from reaching the lower explosive limit/lower flammability limit (LEL/LFL), the detection shall be set at 25 percent of the LEL/LFL.
731	CAAM	3905.1.1 System design. Flammable gas detection system shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be maintained. The gas detection threshold shall be not greater than 25 percent of the lower explosive limit/lower flammability limit (LEL/LFL) of the materials, unless otherwise approved in accordance with the applicable building code.	3905.1.1 System design. The flammable gas detection system shall be listed or approved and shall be calibrated to the types of fuels or gases used for the extraction process. The gas detection system shall be maintained to activate when the level of flammable gas exceeds 25 percent of the LFL.	Removes construction language and adds the terms "remain" and "maintained". These thresholds are not found in any VCC, IBC or IFGC sections. Similar references in other portions of the SFPC. The detection system shall activate any time that the flammable gas concentration exceeds one-fourth the concentration necessary to support combustion. Early detection of the gas will allow mitigation procedures to be taken. A gas detection system in the room or area where the flammable gas solvent is being used results in early notification of a leak or release that is occurring before the gas reaches a hazardous concentration.
732	CAAM	5003.1.1 Maximum allowable quantity per control area. The maximum allowable quantity per control area shall be maintained in accordance with the applicable building code, or Table 5003.1.1(3) and Table 5003.1.1(4) for outdoor control areas.	5003.1.1 Maximum allowable quantity per control area. The maximum allowable quantity per control area shall be maintained in accordance with the applicable building code, or Table 5003.1.1(3) and Table 5003.1.1(4) for outdoor control areas.	
733	CAAM	All references in the 2018 SFPC to "Tables 5003.1.1(1), 5003.1.1(2) or 5003.1.1(3)" will be replaced with a reference to "Section 5003.1.1".		
734	CAAM	5003.1.3 Quantities not exceeding the maximum allowable quantity per control area. The storage, use and handling of hazardous materials in quantities not exceeding the maximum allowable quantity per control area indicated in the applicable building code shall be in accordance with Sections 5001 and 5003. For outdoor control areas, quantities exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(3) or 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.	5003.1.3 Quantities not exceeding the maximum allowable quantity per control area. The storage, use and handling of hazardous materials in quantities not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.	Simply indicates that storage of hazardous materials in quantities less than the MAQ are subject to the maintenance and operation requirements of sections 5001 and 5003.
735	CAAM	5003.1.4 Quantities exceeding the maximum allowable quantity per control area. The storage, use and handling of hazardous materials in quantities exceeding the maximum allowable quantity per control area indicated in the applicable building code shall be approved by the building official in accordance with the applicable building code and maintained in accordance with this Chapter. For outdoor control areas, quantities exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(3) or 5003.1.1(4) shall be in accordance with this Chapter.	5003.1.4 Quantities exceeding the maximum allowable quantity per control area. The storage and use of hazardous materials in quantities exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be approved by the Building Code Official in accordance with the applicable building code.	Uses the MAQ threshold to send excessive storage of hazardous materials back to the building official for review. It no longer mandates additional design or construction requirements.
736	CAAM	5003.2 Systems, equipment and processes. Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall be in accordance with Sections 5003.2.1 through 5003.2.9	5003.2 Systems, equipment and processes. Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall be in accordance with Sections 5003.2.1 through 5003.2.8	No need to change this section as it simply references the subsections below.
737	CAAM	Rename and renumber to Table 5003.12 Outdoor Separation	TABLE 5003.8.2	Keeps table as reference for further review. Does not require construction.
738	CAAM	Strike "a detached building" on top row of Table and replace with "separation"	DETACHED BUILDING EVALUATION	
739	CAAM		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 the applicable building code.	Restores original language for editorial purposes and the exception from the 2018 IFC. This section, in conjunction with the MAQ tables in Section 5003.1, utilizes a density concept for hazardous materials through the use of control areas. The intent of the control area concept is to provide an alternative method for the handling of hazardous materials without usually classifying the occupancy as Group H in accordance with the applicable building code. Typically, in order to not be considered Group H, the amount of hazardous materials within any single control area bounded by fire barriers, horizontal assemblies, fire walls or exterior walls cannot exceed the MAQ for a specific material listed in Table 5003.1.1(1) or 5003.1.1(2) and the applicable building code. A control area may be an entire building or a portion thereof. Where a building is not compartmented as required by the code for control areas, the entire building would be considered a single control area. Note that MAQs are based on the physical state, situation and hazard classification of materials and that up to the MAQ of each state of each class of material is permitted in each control area, subject to material incompatibility issues (see Section 5003.8.8).
740	CA	Table to remain deleted	TABLE 5003.8.3.2 CONTROL AREAS BY FLOOR LEVEL	Changed table title for clarification
741	CAAM		5003.8.3.3 Number. The maximum number of control areas per floor within a building shall be maintained in accordance with this chapter and the applicable building code.	Added reference to this chapter for maintenance requirements. It is not the code's intent to require multiple control areas. As previously indicated, in a building that is entirely one control area, if the total quantity of hazardous materials does not exceed the MAQ, the building would typically not be classified as Group H in accordance with the applicable building code. Similarly, if the owner is satisfied with an occupancy classification of Group H, multiple control areas would not be required. Therefore, control areas are characterized as an alternative means by which a building can be classified as other than Group H. Again, the provisions are applicable only when control areas are chosen as a design alternative to classification of the occupancy as Group H
742	CA		5003.8.3.5 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 shall comply with this chapter and the applicable building code. The aggregate quantity is allowed to exceed the maximum allowable quantities per control area specified in the applicable building code, 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 and the applicable building code.	Restored this important section that provides additional flexibility for M and S occupancies regarding MAQ limits. This section addresses an option for control areas containing certain nonflammable or noncombustible hazardous materials that are stored in mercantile and storage occupancies, including outdoor control areas. This option would allow Group H-4 materials, which present a health hazard rather than a physical hazard, as well as limited Group H-2 and H-3 materials such as oxidizers, to be stored in both retail display and stock areas of regulated mercantile occupancies and in storage related occupancies in excess of the MAQs of Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building as Group H in accordance with the applicable building code. Without this option, many mercantile and storage occupancies could be classified technically as Group H. The increased quantities of certain hazardous materials are based on the recognition that while there is limited risk in these occupancies, the packaging and storage arrangements can be controlled. This section, in conjunction with Table 5003.11.1, establishes the maximum quantity of the indicated hazardous materials permitted within a single control area of a mercantile occupancy. As indicated in Table 5003.11.1, this section only applies to certain nonflammable solids and nonflammable or noncombustible liquids. Note that this option is not applicable to mercantile and storage occupancies containing hazardous materials other than those indicated in Table 5003.11.1.
743	CAAM		5003.8.4 Gas rooms. Where a gas room is provided it shall be maintained in accordance with the provisions of Chapter 60, this chapter, and the applicable building code.	Changed construction language to maintenance language. Where gas rooms are provided per Chapter 60 or where they are used in accordance with Table 5003.1.1(1). Note to increase the maximum allowable quantity per control area (MAQ) of hazardous materials, they must continue to meet the requirements stated in the subsections that follow. Gas rooms are required by the applicable building code to be protected by automatic sprinklers, separated based on the occupancy, and have ventilation designed to operate at a negative pressure. These requirements are similar to those that apply to exhausted enclosures that allow the quantity increase. This section will bring consistency between the requirements for gas cabinets, exhausted enclosures and gas rooms with respect to application and MAQ.
744	CA		5003.11.1 Maximum allowable quantity per control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single control area of a Group M occupancy or stored in a single control area of a Group S occupancy shall not exceed the increased amounts set forth in the applicable building code.	Added reference to the MAQ table for evaluation by the Building Official when storing or using excessive quantities of hazardous materials. Table 5003.1.1 lists the hazardous materials eligible for the mercantile and storage occupancy option and the corresponding MAQs depending on the extent of protection provided. The permitted quantities (without requiring additional review and approval from the building official) of each listed material are independent of each other, as well as the various classes or physical state of a specific material. For example, a given control area could contain up to the permitted maximum quantity of Class 2 solid oxidizers, Class 3 solid oxidizers and Class 2 liquid oxidizers, in addition to the permitted quantities of corrosive materials.
745	CAAM	Table to be renamed: MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS	TABLE 5003.11.1 MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS <sup>d</sup> , e, f	Added table for reference.
746	CAAM	5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single outdoor control area of a Group M occupancy shall not exceed the amounts set forth in Table 5003.11.1.	5003.11.2 Maximum allowable quantity per outdoor control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single outdoor control area of a Group M occupancy shall not exceed the amounts set forth in the applicable building code. Quantities exceeding those listed in Table 5003.11.1 shall be approved by the Building Official in accordance with the applicable building code.	Identical to 5003.11.1 but for outside areas.
747	CAAM		5003.11.3 Storage and display. Storage and display shall be in accordance with Sections 5003.11.3.1 through 5003.11.3.10.	Storage and display methods are not regulated by the building code. This section is editorial for the following subsections.

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		5003.11.3.2 Storage and display height. Unless otherwise approved in accordance with the applicable building code, display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.	5003.11.3.2 Storage and display height. Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.	The height of display/storage is an operational issue not a construction requirement. This section limits Group M display height to 6 feet (1829 mm). In storage areas of Group M occupancies and Group S occupancies, the storage height is increased to 8 feet (2438 mm) in recognition of the fact that these areas are not normally open to the public. These areas are also subject to the density requirements of Section 5003.11.3.1.
772	CAAM			
773	CA		5003.11.3.4 Racks and shelves. Racks and shelves used for storage or display shall be maintained in accordance with Section 5003.9.9.	Rack and shelf arrangements are operational requirements, not construction. The arrangement and operation of racks and shelves must be maintained to the requirements of Section 5003.9.9. See also Chapter 32 for high-piled combustible storage and rack storage over 12 feet in height.
774	CA		5003.11.3.8 Floors. Floors shall be maintained in accordance with section 5004.12 unless otherwise approved by the applicable building code.	Display storage of hazardous materials is typically only permitted where floors are non-combustible materials.
779	CAAM		TABLE 5004.2.2 REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL SOLIDS AND LIQUIDS STORAGE	Restored table which provides reference to other chapters for maintenance requirements of secondary containment.
807	CAAM	5005.2.1.4 Secondary containment for hazardous material liquids. Where secondary containment is provided in accordance with the applicable building code for hazardous material liquids it shall be maintained.	5005.2.1.4 Secondary containment for hazardous material liquids. Where required by the applicable building code and Table 5005.2.1.4, buildings, rooms or areas where hazardous material liquids are dispensed or used in open systems shall maintain secondary containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system: greater than 1.3 gallons (5 L). 2. Multiple vessels or systems: greater than 5.3 gallons (20 L).	Provides reference to secondary containment requirements only when found to be required by the applicable building code. Table 5005.2.1.4 lists conditions where secondary spill containment is typically required by the applicable building code. The containment must be maintained to the requirements of Section 5004.2.2 where the capacity of a single vessel exceeds 1.3 gallons (5 L) or multiple vessels exceed 5.3 gallons (20 L).
808	CAAM	Table to remain deleted	TABLE 5005.2.1.4 REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL LIQUIDS USE	Provides table for reference.
812	CAAM	5005.2.2.3 Spill control for hazardous material liquids. Where provided in accordance with the applicable building code for buildings, rooms or areas where hazardous material liquids are used in individual vessels exceeding a 55-gallon (208 L) capacity with the applicable building code, spill control shall be maintained in accordance with Section 5004.2.	5005.2.2.3 Spill control for hazardous material liquids. Where required by the applicable building code, spill control for buildings, rooms or areas where hazardous material liquids are used in individual vessels exceeding a 55-gallon (208 L) capacity shall be provided with spill control in accordance with Section 5004.2.	Restores technical provisions from the IFC where required by the applicable building code. See section 5004.2
813	CAAM	5005.2.2.4 Secondary containment for hazardous material liquids. Where provided in accordance with the applicable building code, secondary containment for buildings, rooms or areas where hazardous material liquids are used shall be maintained in accordance with section 5004.2.2.	5005.2.2.4 Secondary containment for hazardous material liquids. Where required by the applicable building code and Table 5005.2.1.4, buildings, rooms or areas where hazardous material liquids are used in vessels or systems shall maintain secondary containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system: greater than 55 gallons (208 L). 2. Multiple vessels or systems: greater than 1,000 gallons (3785 L).	Restores technical provisions from the IFC where required by the applicable building code. See section 5004.2.2.
814	CAAM	5005.3.4 Spill control for hazardous material liquids in open systems. Outdoor areas where hazardous material liquids are dispensed in vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be provided with spill control in accordance with the applicable building code.	5005.3.4 Spill control for hazardous material liquids in open systems. Outdoor areas where hazardous material liquids are dispensed in vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be provided with spill control in accordance with Section 5004.2.1 and the applicable building code.	Restored reference to section 5004.2.1. The dispensing and use areas of open systems located outdoors also require spill controls to be maintained when the individual containers being filled exceed 1.3 gallons (5 L) or the combined vessels or systems exceed 5.3 gallons (20 L).
815	CAAM	5005.3.5 Secondary containment for hazardous material liquids in open systems. Where required, outdoor areas where hazardous material liquids are dispensed or used in open systems shall be provided with secondary containment in accordance with the applicable building code where the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system: greater than 1.3 gallons (5 L). 2. Multiple vessels or systems: greater than 5.3 gallons (20 L).	5005.3.5 Secondary containment for hazardous material liquids in open systems. Where required by the applicable building code and Table 5005.2.1.4, outdoor areas where hazardous material liquids are dispensed or used in open systems shall maintain secondary containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system: greater than 1.3 gallons (5 L). 2. Multiple vessels or systems: greater than 5.3 gallons (20 L).	Changed "provided" to "maintained" and restored reference to section 5004.2.2. Dispensing and use areas of open systems located outdoors also require secondary spill controls to be maintained when the requirements of Table 5005.2.1.4 are met and the individual containers being filled exceed 1.3 gallons (5 L) or the combined vessels or systems exceed 5.3 gallons (20 L).
816	CAAM	5005.3.6 Spill control for hazardous material liquids in closed systems. Outdoor areas where hazardous material liquids are used in closed systems exceeding 55 gallons (208 L) shall be provided with spill control in accordance with the applicable building code.	5005.3.6 Spill control for hazardous material liquids in closed systems. Outdoor areas where hazardous material liquids are used in closed systems exceeding 55 gallons (208 L) shall maintain spill control in accordance with the applicable building code.	Changed "provided" to "maintained" and restored reference to section 5004.2.1. Outdoor closed systems with a liquid capacity of over 55 gallons (208 L) must have spill control maintained.
817	CAAM	5005.3.7 Secondary containment for hazardous material liquids in closed systems. Where required, outdoor areas where hazardous material liquids are dispensed or used in closed systems shall be provided with secondary containment in accordance with the applicable building code where the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system greater than 55 gallons (208 L). 2. Multiple vessels or systems greater than 1,000 gallons (3785 L).	5005.3.7 Secondary containment for hazardous material liquids in closed systems. Where required, outdoor areas where hazardous material liquids are dispensed or used in closed systems shall maintain secondary containment in accordance with the applicable building code and section 5004.2.2 where the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system greater than 55 gallons (208 L). 2. Multiple vessels or systems greater than 1,000 gallons (3785 L).	Changed "provided" to "maintained" and restored reference to section 5004.2.2. Dispensing and use areas of closed systems located outdoors also require secondary spill controls to be maintained when the individual containers being filled exceed 55 gallons (208 L) or the combined vessels or systems exceed 1,000 gallons (3785 L).
819	CAAM	5005.4.1 Quantities exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor locations in amounts exceeding the maximum allowable quantity per the applicable building code shall be in accordance with Sections 5001, 5003, 5005.1 and 5005.4.	5005.4.1 Quantities exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor and outdoor locations in amounts exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be reviewed by the building official in accordance with the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5005.1 and 5005.4.	When the indoor and outdoor storage amounts of chemicals are above the MAGs per control area in accordance with the applicable building code, the area must be reviewed by the building official in accordance with the applicable building code and be maintained to meet the requirements of Sections 5001, 5003, 5005.1 and 5005.4.
820	CAAM	5005.4.2 Quantities not exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in the applicable building code shall be in accordance with Sections 5001 and 5003 and 5005.1. Handling of hazardous materials in outdoor locations in amounts not exceeding the maximum allowable quantity per Table 5003.1.1(3) and 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.	5005.4.2 Quantities not exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) and 5003.1.1(2) and the applicable building code shall be in accordance with Sections 5001 and 5003 and 5005.1. Handling of hazardous materials in outdoor locations in amounts not exceeding the maximum allowable quantity per control area indicated Table 5003.1.1(3) and 5003.1.1(4) and the applicable building code shall be in accordance with Sections 5001 and 5003.	Restores the IFC sentence about indoor handling which was deleted in the 2015 VSPFC.
823	CAAM	5104.2 Storage in Groups A, B, E, F, I and R. Storage quantities of Level 2 and 3 aerosol products in occupancies in Groups A, B, E, F, I and R shall be limited and maintained in accordance with the applicable building code.	5104.2 Unless otherwise approved by the applicable building code, storage of Level 2 and 3 aerosol products in occupancies in Groups A, B, E, F, I and R shall be limited to the following maximum quantities: 1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products. 2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products. 3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products. The maximum quantity shall be increased 100 percent where the excess quantity is stored in storage cabinets in accordance with Section 5704.3.2.	Restores IFC regulations for quantity of storage in particular use groups. This section strictly limits quantities of aerosols in buildings of Groups A, B, E, F, I and R because these occupancy types will have higher occupant loads and host many activities not related to the storage of aerosol products. Storage exceeding the maximum permitted quantities would result in the building being classified as a high-hazard, Group H occupancy in accordance with the IBC. The indicated maximum quantities are applicable per building area and not per control area (see commentary, Section 5003).  This section would also allow the maximum quantities to be increased by 100 percent, if the quantities exceeding those indicated for Level 2 and 3 aerosol products are stored in approved storage cabinets in accordance with Section 5704.3.2, which contains specific requirements for the design, construction and capacity of storage cabinets.
826	CAAM	Table to remain deleted	TABLE 5104.3.1 NONSEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN GENERAL PURPOSE WAREHOUSES	Operational storage guidance for nonsegregated storage.
828	CAAM	Table to remain deleted	TABLE 5104.3.2 SEGREGATED STORAGE OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN GENERAL PURPOSE WAREHOUSES	Operational storage guidance for segregated storage.
829	CAAM	5104.3.2.1 Chain link fence enclosures. Chain link fence enclosures shall be maintained in accordance with the applicable building code.	5104.3.2.1 Chain-link fence enclosures. Unless otherwise approved by the applicable building code, chain-link fence enclosures required by Table 5104.3.2 shall be maintained in accordance with the following: 1. The fence shall not be less than No. 9 gage steel wire, woven into a maximum 2-inch (51 mm) diamond mesh. 2. The fence shall be maintained from the floor to the underside of the roof or ceiling above. 3. Class IV and high-hazard commodities shall be stored outside of the aerosol storage area and a minimum of 8 feet (2438 mm) from the fence. 4. Access openings in the fence shall be maintained with either self- or automatic-closing devices or a labyrinth opening arrangement preventing aerosol containment from rocketing through the access openings. 5. Not less than two means of egress shall be maintained from the fenced enclosure.	Restores technical provisions from the IFC for maintenance of chain-link fence enclosures. Table 5104.3.2 establishes limits on the use of a chain-link fence as a means of segregated storage of Level 2 and 3 aerosol products. A chain-link fence enclosure is intended to reduce the potential hazard of "rocketing" aerosol cans in a fire. Both fire tests and loss history have shown that ruptured aerosol cans in fires will "rocket" through the warehouse storage area, resulting in multiple ignition locations and overtaking of the fire protection systems. Chain-link fence construction details as indicated in this section, in combination with proper sprinkler protection as specified in Notes b and c of Table 5104.3.2, provide a measure of additional safety, allowing increased storage quantities over that permitted where no physical barrier exists.  The No. 9 gage steel requirement for the chain-link fence is similar to a standard, industrial-grade chain-link gage that is commonly used for fencing property. This chain-link gage is considered the lightest acceptable fencing and is capable of restraining flying aerosol containers. A labyrinth opening arrangement in the fencing essentially works as an entryway maze. In place of a door, the access area to the chain-link fence enclosure would be constructed of other fencing, which is usually located at right angles, and through its arrangement, would obstruct the opening to prevent the aerosol containers from rocketing through the access opening.
830	CA		5104.3.2.2 Aisles. The minimum aisle requirements for solid pile or palletized segregated storage in general purpose warehouses shall be maintained in accordance with Table 5104.3.2.2 and remain in accordance with the applicable building code.	
831	CAAM	Delete bottom two rows of table related to rack storage	TABLE 5104.3.2 SEGREGATED STORAGE AISLE WIDTHS AND DISTANCE TO AISLES IN GENERAL PURPOSE WAREHOUSES	Restores technical provision about the storage arrangements of Aerosol products.
832	CA		5104.4 Storage in aerosol warehouses. The total quantity of Level 2 and 3 aerosol products in a warehouse utilized for the storage, shipping and receiving of aerosol products shall not be restricted in structures complying with Sections 5104.4.1 through 5104.4.4. 5104.5.1 Storage rooms of 500 square feet or less. Unless otherwise permitted by the applicable building code, the storage of aerosol products in flammable liquid storage rooms less than or equal to 500 square feet (46 m <sup>2</sup> ) in area shall not exceed the following quantities: 1. A net weight of 1,000 pounds (454 kg) of Level 2 aerosol products. 2. A net weight of 500 pounds (227 kg) of Level 3 aerosol products. 3. A combined net weight of 1,000 pounds (454 kg) of Level 2 and 3 aerosol products. 5104.5.2 Storage rooms greater than 500 square feet. The storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46 m <sup>2</sup> ) in area shall not exceed the following quantities: 1. A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products. 2. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products. 3. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products. The maximum aggregate storage quantity of Level 2 and 3 aerosol products permitted in separate inside storage rooms protected by an approved automatic sprinkler system in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).	Restores editorial language for the subsection.
833	CAAM	Section to remain deleted	5104.5.2 Storage rooms greater than 500 square feet. Unless otherwise permitted by the applicable building code, the storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46 m <sup>2</sup> ) in area shall not exceed the following quantities: A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products. The maximum aggregate storage quantity of Level 2 and 3 aerosol products permitted in separate inside storage rooms protected by an approved automatic sprinkler system in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).	Restores operational storage thresholds for proper aerosol product storage. These thresholds are identical to those since at least the 1996 BOCA. This section is for small storage areas. This is not a construction requirement.
834	CAAM	Section to remain deleted	5104.5.2 Storage rooms greater than 500 square feet. Unless otherwise permitted by the applicable building code, the storage of aerosol products in flammable liquid storage rooms greater than 500 square feet (46 m <sup>2</sup> ) in area shall not exceed the following quantities: A net weight of 2,500 pounds (1135 kg) of Level 2 aerosol products. A net weight of 1,000 pounds (454 kg) of Level 3 aerosol products. A combined net weight of 2,500 pounds (1135 kg) of Level 2 and 3 aerosol products. The maximum aggregate storage quantity of Level 2 and 3 aerosol products permitted in separate inside storage rooms protected by an approved automatic sprinkler system in accordance with NFPA 30B shall be 5,000 pounds (2270 kg).	Restores operational storage thresholds for proper aerosol product storage. These thresholds are identical to those since at least the 1996 BOCA. This section is for large storage areas. This is not a construction requirement.

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845	CAAM	Table to remain deleted	TABLE 5104.7 MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN RETAIL STORAGE AREAS	Operational storage arrangements for Level 2 and 3 aerosols in retail storage areas.
847	CAAM	Table to remain deleted	TABLE 5106.2.1 MAXIMUM QUANTITIES OF LEVEL 2 AND 3 AEROSOL PRODUCTS IN RETAIL DISPLAY AREAS	Restores operational guidance and requirements for storage above 8ft in height. Prior to about 1990, the typical mercantile store displayed merchandise to heights of about 8 feet (2438 mm). In the years since, merchandising techniques have changed substantially so that item displays now exceed 8 feet (2438 mm) in what are called "big box" stores. Section 5106.2 and its subsections regulate the more traditional type of stores where display and merchandising of Level 2 and 3 aerosol products do not exceed 8 feet (2438 mm) in height. See the commentary to Section 5106.3 for information on displays greater than 8 feet (2438 mm) in height.
843	CAAM	Table to remain deleted	TABLE 5106.4 MAXIMUM STORAGE QUANTITIES FOR STORAGE AREAS ADJACENT TO RETAIL DISPLAY OF LEVEL 2 AND 3 AEROSOLS	Restores important reference criteria for proper storage arrangements. These are operational requirements, not construction.
863	CAAM	5601.8.1.1 Mass-detonating explosives (Division 1.1, 1.2 or 1.5). The total net explosive weight of mass-detonating explosives (Division 1.1, 1.2 or 1.5) shall be used. See Table 5604.5.2(1) as appropriate. Exception: Where the TNT equivalence of the explosive material has been determined, the equivalence is allowed to be used to establish the net explosive weight.	5601.8.1.1 Mass-detonating explosives (Division 1.1, 1.2 or 1.5). The total net explosive weight of mass-detonating explosives (Division 1.1, 1.2 or 1.5) shall be used. See Table 5604.5.2(1) or 5605.3 as appropriate. Exception: When the TNT equivalence of the explosive material has been determined, the equivalence is allowed to be used to establish the net explosive weight.	Restores reference to a critical table that was removed. Also restores an important exception. Mass-detonating explosives are typically classified as Group H-1 by the applicable building code, and present a detonation hazard and a greater threat to adjacent objects and structures. The code, therefore, contains provisions in Table 5605.3 to deal with the separation distances for mass explosion hazards. This section establishes the weights to be used when applying that table as the total net weight of all mass-detonating explosive hazard divisions.
864	CAAM		5601.8.1.3 Combinations of mass-detonating and nonmass-detonating explosives (excluding Division 1.4). Combination of mass-detonating and nonmass-detonating explosives (excluding Division 1.4) shall be as follows: 1. When Division 1.1 and 1.2 explosives are located in the same site, determine the distance for the total quantity considered first as 1.1 and then as 1.2. The required distance is the greater of the two. When the Division 1.1 requirements are controlling and the TNT equivalence of the 1.2 is known, the TNT equivalent weight of the 1.2 items shall be allowed to be added to the total explosive weight of Division 1.1 items to determine the net explosive weight for Division 1.1 distance determination. See Table 5604.5.2(2) or 5605.3, as appropriate. 2. When Division 1.1 and 1.3 explosives are located in the same site, determine the distances for the total quantity considered first as 1.1 and then as 1.3. The required distance is the greater of the two. When the Division 1.1 requirements are controlling and the TNT equivalence of the 1.3 is known, the TNT equivalent weight of the 1.3 items shall be allowed to be added to the total explosive weight of Division 1.1 items to determine the net explosive weight for Division 1.1 distance determination. See Table 5604.5.2(1) or 5605.3 shall be used when TNT equivalence is used to establish the net explosive weight. 3. When Division 1.1, 1.2 and 1.3 explosives are located in the same site, determine the distances for the total quantity considered first as 1.1, next as 1.2 and finally as 1.3. The required distance is the greatest of the three. As allowed by paragraphs 1 and 2 above, TNT equivalent weights for 1.2 and 1.3 items are allowed to be used to determine the net weight of explosives for Division 1.1 distance determination. Table 5604.5.2(1) or 5605.3 shall be used when TNT equivalence is used to establish the net explosive weight. 4. For composite pyrotechnic items Division 1.1 and Division 1.3, the sum of the net weights of the pyrotechnic composition and the explosives involved shall be used. See Tables 5604.5.2(1) and 5604.5.2(2).	Restores reference to a critical table that was removed. This section establishes the explosive material weights to be used when applying the various distance tables in Sections 5604 and 5605 for mixed storage combinations of explosives classified as both mass detonating and nonmass detonating. The most hazardous explosives will likely drive the distance requirements.
865	CA	5605.1 General. The restricted and unrestricted manufacture, assembly and testing of explosives, ammunition, blasting agents and fireworks shall comply with the requirements of this section, NFPA 495, NFPA 1124, or NFPA 1126. Exceptions: 1. The hand loading of small arms ammunition prepared for personal use and not offered for resale. 2. The mixing and loading of blasting agents at blasting sites in accordance with NFPA 495. 3. The use of binary explosives or phosphoric materials in blasting or pyrotechnic special effects applications in accordance with NFPA 495 or NFPA 1126.	5605.1 General. The manufacture, assembly and testing of explosives, ammunition, blasting agents and fireworks shall comply with the requirements of this section, Title 59.1, Chapter 11 of the Code of Virginia, and NFPA 495, NFPA 1124, or NFPA 1126. Exceptions: 1. The hand loading of small arms ammunition prepared for personal use and not offered for resale. 2. The mixing and loading of blasting agents at blasting sites in accordance with NFPA 495. 3. The use of binary explosives or phosphoric materials in blasting or pyrotechnic special effects applications in accordance with NFPA 495 or NFPA 1126.	Revises this section to include reference to NFPA 1124 which was removed. This section covers emergency planning, separation of operating and manufacturing buildings; control areas; operations and maintenance for the manufacturing, assembling and testing of explosives, blasting agents and fireworks. Section 5606 covers small arms ammunition. Exceptions 2 and 3 are addressed in NFPA standards.  Fireworks manufacturing is a relatively localized or concentrated industry. Most fireworks plants have settled and remain in predominantly rural locations for several reasons. Substantial sites are required to allow for isolation of manufacturing and storage buildings from one another to limit hazard exposures. These sites permit insulation from regulatory supervision. Skilled workers are required to assemble the fireworks: as a result, a loyal workforce usually develops in the regions where plants are located. Consequently, the local economy usually becomes heavily dependent on the industry's presence. Further, public concern and outcry is minimized by these factors, since occasional accidents are more or less expected. Increased regulatory attention and the prohibition of common fireworks in many states has, however, led to increased foreign competition that has further impacted the industry. Today, fewer than 100 American firms are engaged in this activity and they employ less than 3,000 persons. The U.S. Department of Treasury (DOTY) enforces regulations (DOTY 27 CFR, 55 and 181) restricting the import, manufacture, storage and use of fireworks and explosives.
866	CAAM	5605.3 Intraplant separation of operating buildings. Separation of explosives manufacturing buildings and fireworks manufacturing buildings, including those where explosive charges are assembled, manufactured, prepared or loaded utilizing Division 1.1, 1.2, 1.3, 1.4 or 1.5 explosives shall be separated from all other buildings, including magazines, within the confines of the manufacturing plant, at a distance not less than that required by the applicable building code or 5604.5.2(3), as applicable. The quantity of explosives in an operating building shall be the net weight of all explosives contained therein.	5605.3 Intraplant separation of operating buildings. Unless otherwise approved in accordance with the applicable building code, explosives manufacturing buildings and fireworks manufacturing buildings, including those where explosive charges are assembled, manufactured, prepared or loaded utilizing Division 1.1, 1.2, 1.3, 1.4 or 1.5 explosives, shall be separated from all other buildings, including magazines, within the confines of the manufacturing plant, at a distance not less than those shown in Table 5605.3 or 5604.5.2(3), as appropriate. Exception: Fireworks manufacturing buildings separated in accordance with NFPA 1124. The quantity of explosives in an operating building shall be the net weight of all explosives contained therein. Distances shall be based on the hazard division requiring the greatest separation, unless the aggregate explosive weight is divided by approved walls or shields designed for that purpose. When dividing a quantity of explosives into smaller stacks, a suitable barrier or adequate separation distance shall be provided to prevent propagation from one stack to another. When distance is used as the sole means of separation within a building, such distance shall be established by testing. Testing shall demonstrate that propagation between stacks will not result. Barriers provided to protect against explosive effects shall be designed and installed in accordance with approved standards.	This is an operational regulation not a building construction requirement. It is a critical table referenced by many sections and needs to be restored. Manufacturing operations frequently contain explosive materials that may fall into more than one division. When such is the case, Q-D relationships are established on the most severe case. The separation of explosives into piles by distance or the construction of substantial dividing walls (barrier wall) is a recognized means of mitigating the effects of configuration by propagation. Propagation distances are established by testing. The construction of barriers can be accomplished by various means; however, the design of such structures must be specific to address the nature (impulse pressures) and time factors involved with the energy produced by explosive materials. The primary reference is U.S. Army Technical Manual TM 51300, Air Force Manual (AFM) 8822 and Navy NAVFAC P397, Structures to Resist the Effects of Accidental Explosions.  The exception recognizes that NFPA 1124 requirements cover site security, separation distances for manufacturing facilities; storage of salute and black powder; building construction and transportation of fireworks.
867	CAAM	Table to remain deleted	TABLE 5605.3 MINIMUM INTRAPLANT (INTRAPLANT) SEPARATION DISTANCES (LD OR IPD) BETWEEN BARRICADED OPERATING BUILDINGS CONTAINING EXPLOSIVES—DIVISION 1.1, 1.2 OR 1.5 MASS-EXPLOSION HAZARDA	Restores the critical table that is referenced by many other sections. Table 5605.3 has been designed to recognize explosives that either detonate or present a mass-explosion hazard (Divisions 1.1, 1.2 and 1.5). Under the classification system used by the code there is a need to recognize the various hazards of explosive materials when classified in other divisions, specifically Division 1.3 and 1.4 materials. The hazards of Division 1.3 materials are mass fire hazards where fire can involve the aggregate amount of undivided material. As finished goods, the hazards of Division 1.4 materials are limited to events with the individual articles. Division 1.5 materials are capable of detonation, and including them in Table 5605.3 represents the most conservative case. This table applies to the separation distances within an explosive manufacturing plant. Of course, the distance is related to the amount of explosives in storage. Distance and barricades are means of reducing damage to property and injury to personnel. With a barricade, the distance is sufficient, but without a barricade, the distance must be doubled to be the equivalent of a barricade. The quantity is calculated in pounds in each structure or building.
868	CAAM	5605.4 Separation of manufacturing operating buildings from inhabited buildings, public traffic routes and magazines. Where an operating building on an explosive materials plant site is designed to contain explosive materials, the distance between such a building and inhabited buildings, public traffic routes and magazines, required by the applicable building code, shall be maintained.	5605.4 Separation of manufacturing operating buildings from inhabited buildings, public traffic routes and magazines. When an operating building on an explosive materials plant site contains explosive materials, such an operation shall be located away from inhabited buildings, public traffic routes and magazines in accordance with Table 5604.5.2(2) or 5604.5.2(3) as appropriate, based on the maximum quantity of explosive materials permitted to be in the building at one time (see Section 5601.8). Exception: Fireworks manufacturing buildings constructed and operated in accordance with NFPA 1124.	Revised the language to indicate operational requirements not building construction regulations. Buildings and other facilities used for mixing of blasting agents at a fixed location must comply with the separation requirements of Table 5604.5.2(1). The buildings must be isolated for the protection of life and nearby property. Suitable exterior barricades, natural or artificial, are to be provided on pressure-relief sides of buildings. The exception recognizes that NFPA 1124 requirements cover site security, separation distances for manufacturing facilities; storage of salute and black powder; building construction and transportation of fireworks.
869	CAAM	5605.5 Buildings and equipment. Buildings or rooms that exceed the maximum allowable quantity per control area of explosive materials shall be operated in accordance with this section and maintain the requirements of the applicable building code for Group H occupancies.	5605.5 Buildings and equipment. Buildings or rooms that exceed the maximum allowable quantity per control area of explosive materials shall be operated in accordance with this section and maintain the requirements of the applicable building code for Group H occupancies. Exception: Fireworks manufacturing buildings constructed and operated in accordance with NFPA 1124.	Added language to clarify maintenance requirements for Group H occupancies in accordance with the applicable building code. The exception recognizes that NFPA 1124 requirements cover site security, separation distances for manufacturing facilities, storage of salute and black powder, and transportation of fireworks.
900	CAAM	5605.6.4 Quantity limits. The quantity of explosives at any particular work station shall be limited to that posted on the load limit signs for the individual work station. The total quantity of explosives for multiple workstations shall not exceed that established by the intraplant distances in Table 5605.3 or 5604.5.2(3), as appropriate, unless approved in accordance with the applicable building code.	5605.6.4 Quantity limits. The quantity of explosives at any particular work station shall be limited to that posted on the load limit signs for the individual work station. The total quantity of explosives for multiple workstations shall not exceed that established by the intraplant distances in Table 5605.3 or 5604.5.2(3), as appropriate, unless approved in accordance with the applicable building code.	Restored the references to 5605.3 and 5604.5.2(3) for this operational signage requirement. The maximum permissible quantities of explosive materials allowed by Table 5605.3 must be clearly indicated with suitable signs, usually with letters not less than 3 inches (76 mm) high.
901	CAAM	5605.6.4.1 Magazines. Magazines used for storage in processing areas shall be in accordance with the requirements of Section 5604.5.1. All explosive materials shall be removed to appropriate storage magazines for unattended storage at the end of the work day. The contents of indoor magazines shall be added to the quantity of explosives contained at individual workstations and the total quantity of material stored, processed or used shall be utilized to establish the intraplant separation distances indicated by Table 5605.3 or 5604.5.2(3), as appropriate.	5605.6.4.1 Magazines. Magazines used for storage in processing areas shall be in accordance with the requirements of Section 5604.5.1. All explosive materials shall be removed to appropriate storage magazines for unattended storage at the end of the work day. The contents of indoor magazines shall be added to the quantity of explosives contained at individual workstations and the total quantity of material stored, processed or used shall be utilized to establish the intraplant separation distances indicated by Table 5605.3 or 5604.5.2(3), as appropriate.	Restores reference to a critical table that was removed.
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		5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including: 1. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23. 2. Medicines, foodstuffs, cosmetics, and commercial, institutional and industrial products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L). 3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L). 4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 603. For abandonment of fuel oil tanks, this chapter applies. 5. Refrigerant liquids and oils in refrigeration systems (see Section 606). 6. Storage and display of aerosol products complying with Chapter 51. 7. Storage and use of liquids that have no fire point when tested in accordance with ASTM D 92. 8. Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion. 9. Liquids without flash points that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons. 10. The storage of distilled spirits and wines in wooden barrels and casks.	5701.2 Nonapplicability. This chapter shall not apply to liquids as otherwise provided in other laws or regulations or chapters of this code, including: 1. Specific provisions for flammable liquids in motor fuel-dispensing facilities, repair garages, airports and marinas in Chapter 23. 2. Medicines, foodstuffs, cosmetics, and commercial, institutional and industrial products containing not more than 50 percent by volume of water-miscible liquids and with the remainder of the solution not being flammable, provided that such materials are packaged in individual containers not exceeding 1.3 gallons (5 L). 3. Quantities of alcoholic beverages in retail or wholesale sales or storage occupancies, provided that the liquids are packaged in individual containers not exceeding 1.3 gallons (5 L). 4. Storage and use of fuel oil in tanks and containers connected to oil-burning equipment. Such storage and use shall be in accordance with Section 603. For abandonment of fuel oil tanks, this chapter applies. 5. Refrigerant liquids and oils in refrigeration systems (see Section 606). 6. Storage and display of aerosol products complying with Chapter 51. 7. Storage and use of liquids that have no fire point when tested in accordance with ASTM D 92. 8. Liquids with a flash point greater than 95°F (35°C) in a water-miscible solution or dispersion with a water and inert (noncombustible) solids content of more than 80 percent by weight, which do not sustain combustion. 9. Liquids without flash points that can be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons. 10. The storage of distilled spirits and wines in wooden barrels and casks.	Restores critical exemptions. This section is an acknowledgment that some flammable and combustible liquids are regulated by other laws or by other chapters of the code. The application of these other laws or code chapters takes precedence over the requirements in this chapter. Note that most of the items listed in this section correlate to Section 9.1.4 of NFPA 30 (see also commentary, Section 5001.1).
303	CAAM		5701.3 Referenced documents. The applicable requirements of Chapter 50, other chapters of this code, and the applicable building code pertaining to flammable liquids shall apply.	Restores important references and clarifications. The requirements to regulate the design, construction and maintenance of facilities using flammable and combustible liquids are contained in more than one document. The code contains several chapters that address requirements for the storage, handling, dispensing, processing, transportation and use of flammable and combustible liquids.
304	CA		5703.1 Electrical. Electrical wiring and equipment shall be maintained in accordance with Chapter 6 and NFPA 70 and the applicable building code.	Restores references to Chapter 6 and NFPA 70.
305	CA	5703.1.1 Classified locations for flammable liquids. Where flammable liquids are stored, handled, dispensed or mixed, the extent of classified locations identified in accordance with the applicable building code shall be maintained. The extent of the classified area is allowed to be reduced, or eliminated, where sufficient technical justification is provided to the fire code official that a concentration in the area in excess of 25 percent of the lower flammable limit (LFL) cannot be generated.	5703.1.1 Classified locations for flammable liquids. Areas where flammable liquids are stored, handled, dispensed or mixed shall be in accordance with Table 5703.1.1 unless otherwise classified by the applicable building code. A classified area shall not extend beyond an unperforated floor, roof or other solid partition.  The extent of the classified area is allowed to be reduced, or eliminated, where sufficient technical justification is provided to the fire code official that a concentration in the area in excess of 25 percent of the lower flammable limit (LFL) cannot be generated.	Restores the limits and exceptions for classified areas while also clarifying areas are to be classified in accordance with the applicable building code. Electrical systems can create sparks that can be a source of ignition. Areas of a building where flammable liquids are present are to have the electrical wiring and equipment operated to prevent the electrical system from becoming an ignition source. Class I equipment locations, which require special installation of wiring and equipment, are listed in Table 5703.1.1.
306	CAAM	5703.1.2 Classified locations for combustible liquids. In areas where Class II or III liquids are heated above their flash points the extent of classified locations identified in accordance with the applicable building code shall be maintained.	5703.1.2 Classified locations for combustible liquids. Areas where Class II or III liquids are heated above their flash points shall maintain electrical equipment and wiring in accordance with Section 5703.1.1. Exception: Solvent distillation units in accordance with Section 5705.4.	Removes installation language and provides maintenance language. Also restores an exception. Electrical systems can create sparks that can be a source of ignition. The sparks may be caused by electrical current or static electricity. Areas of a building where combustible liquids are heated to or above their flash points are treated the same as areas containing flammable liquids. Class I equipment locations, which require special wiring and equipment, are listed in Table 5703.1.1.  The exception indicates that use of a solvent distillation unit for the recovery of combustible liquids is not considered a Class I, Group D location. See the commentary to Section 5705.4 for information on solvent distillation units.
308	CAAM	5703.1.3 Other applications. The fire code official is authorized to determine the extent of the Class I electrical equipment and wiring location when a condition is not regulated by the applicable building code, these requirements or NFPA 70.	5703.1.3 Other applications. The fire code official is authorized to determine the extent of the Class I electrical equipment and wiring location when a condition is not specifically covered by the applicable building code, these requirements or NFPA 70.	This is important language from the IFC in cases not regulated by the applicable building code. There may be situations where the code does not specifically cover the hazardous location that should have Class I electrical equipment and wiring. The fire code official has the authority to require Class I electrical equipment and wiring in a location not specifically identified by the code for Division 1 or 2 locations.
309	CAAM		5703.2 Fire protection. Fire protection for the storage, use, dispensing, mixing, handling and on-site transportation of flammable and combustible liquids shall be maintained in accordance with this chapter, Chapter 9 and the applicable building code.	Provides reference to Chapter 9 for fire protection system maintenance.
310	CA		5703.6 Piping systems. Piping systems, and their component parts, for flammable and combustible liquids shall be maintained in accordance with Sections 5703.6.1 through 5703.6.11 and the applicable building code.	Restores editorial scoping language. Piping must be maintained to protect against overpressure or other conditions that could create leaks at joints or rupture the pipes.
311	CA		5703.6.1 Nonapplicability. The provisions of Section 5703.6 shall not apply to gas or oil well installations; piping that is integral to stationary or portable engines, including aircraft, watercraft and motor vehicles; and piping in connection with boilers and pressure vessels regulated by the applicable building code.	Restores important scoping language. Piping of some applications of flammable and combustible liquids is addressed under other code documents or other laws. Other state and federal agencies have laws and authority to regulate the piping for oil and gas wells. Stationary and portable engines are manufactured under other standards that are enforced by other state and federal agencies. Because the piping associated with heating equipment (fuel oil and pressure systems) is addressed by the IMC, those requirements are not repeated here.
312	CA	5703.6.3.1 Existing piping. Existing piping shall be tested in accordance with the applicable building code when the fire code official has reasonable cause to believe that a leak exists. Piping that could contain flammable or combustible liquids shall not be tested pneumatically. Such tests shall be at the expense of the owner or operator. Exception: Vapor-recovery piping is allowed to be tested using an inert gas.	5703.6.3.1 Existing piping. Existing piping shall be tested in accordance with this section when the fire code official has reasonable cause to believe that a leak exists. Piping that could contain flammable or combustible liquids shall not be tested pneumatically. Such tests shall be at the expense of the owner or operator. Exception: Vapor-recovery piping is allowed to be tested using an inert gas.	Restores important guidance about dangerous testing arrangements as well as expense responsibilities. The fire code official may require testing of existing piping. Existing piping is to be tested to the same criteria as new piping, except that piping containing flammable or combustible liquids is not to be pneumatically tested. The introduction of air into these pipes can create a vapor and air mixture that reaches the flammable range.  The exception allows pneumatic testing of a vapor-recovery system with an inert gas (such as nitrogen or carbon dioxide). Because vapor-recovery systems are designed to remove the flammable or combustible vapors and recycle the liquid, these vapors could be removed from the piping during the recovery process; however, the inert gas is still required to prevent the vapor and air mixture from reaching the flammable range before or during the recovery process.
314	CAAM	5703.6.4 Protection from vehicles. Guard posts or other approved means shall be maintained to protect piping, valves or fittings subject to vehicular damage in accordance with Section 312.	5703.6.4 Protection from vehicles. Guard posts or other approved means shall be provided to protect piping, valves or fittings subject to vehicular damage in accordance with Section 312.	Restores maintenance sections regarding vehicle impact protection. Protection from vehicle impact is provided by guard posts or other approved barriers. Section 312 states that the specifications for guard posts or the design forces required for an approved barrier should comply with the code.
315	CAAM		5703.6.5 Protection from external corrosion and galvanic action. Where subject to external corrosion, piping, related fluid-handling components and supports for both underground and above-ground applications shall maintain corrosion protection.	Restores maintenance for corrosion protection. Deterioration of piping and components can cause leaks and spillage of flammable and combustible liquids. Using noncorrosive materials, protective coatings, galvanic protection or a combination of these methods can protect the piping and components. Dissimilar metals are prohibited because of the localized galvanic action that could occur between them. This localized galvanic action could cause one of the metals to corrode while the other metal is protected from corrosion. See Section 5704.2.7.9 for corrosion protection for tanks.
316	CA	5703.6.8 Piping supports. Piping systems required to be substantially supported and protected against physical damage and excessive stresses arising from settlement, vibration, expansion, contraction or exposure to fire shall have the support and protection maintained.	5703.6.8 Piping supports. Piping systems shall be substantially supported and protected against physical damage and excessive stresses arising from settlement, vibration, expansion, contraction or exposure to fire.	Restores piping support maintenance requirements. Pipe supports are necessary to reduce stress on the pipe from both external and internal sources. Personnel are an external source of potential damage to piping, as is unattached equipment hitting the piping system. The pipe supports are to absorb these impact loads to protect the pipe from excess deflection.  Internal forces are caused by the positive and negative pressures created by the operation of pumps and valves. Pumping of flammable and combustible liquids will generate positive pressure in the pipe. This pressure, combined with any pressure required to support the dead weight of the piping system and flammable and combustible liquids in the piping system, can cause the pipe wall to rupture.  The pumping action and the operation of the valve can cause shock waves to travel through the flammable and combustible liquids in a pipe, which can create internal pressures several times larger than normal operating pressures. One type of shock wave is caused by the fast opening and closing of a valve. This pressure wave can place high internal pressures on the piping system.
317	CAAM		5703.6.10 Pipe joints. Joints shall be maintained liquid tight.	Restores maintenance language to ensure that all joints are liquid tight. Pipe joints are to be liquid tight. The code recognizes only three types of generic mechanical joints as being adequate for pipes carrying flammable and combustible liquids. Welded joints, flanged joints and threaded joints provide a liquid-tight joint. ASME B31.3 contains criteria for the welding of piping. This reference is not in this chapter, but is cited in Chapter 50.  Flanged joints are to be made with materials that are compatible with the piping system and the flammable and combustible liquids in the pipe.  Threaded joints are to be fabricated by methods that ensure a liquid-tight joint by the selection of thread pitch and length of the threaded connection. Listed flexible joints are to be approved by the fire code official.  Pipe joints in a building's concealed space that carry Class I flammable liquids are limited to welded joints. Because Class I flammable liquids can become vapor at ambient temperature, a joint leak in a concealed space could go unnoticed. There could be no liquid escaping the concealed space for personnel to notice. A welded joint that has passed the test requirements of Section 5703.6.3 would be a liquid-tight joint that meets code requirements.
318	CA		5704.2.5 Explosion control. Explosion control shall be maintained in accordance with Chapter 9 and the applicable building code.	The vapor from flammable and combustible liquids can cause an explosion when the vapor-air mixture is in an explosive ratio. Explosion control is required to be maintained in a facility storing or using Class IA liquids or a facility that has open use or dispensing of Class IB liquids.
319	CA			

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920	CA	5704.2.7.4 Emergency venting. Where provided in accordance with the applicable building code, emergency venting for stationary, above-ground tanks shall be maintained.	5704.2.7 Maintenance requirements for tanks. Tanks shall be maintained in accordance with NFPA 30. Each tank shall maintain a permanent nameplate or marking indicating the standard used as the basis of design.  5704.2.7.4 Emergency venting. Where required, emergency venting for stationary, above-ground tanks shall be maintained in accordance with NFPA 30 and the applicable building code. Unless otherwise approved by the applicable building code, emergency vents for Class I, II and IIIA liquids shall not discharge inside buildings. Exceptions: 1. Tanks larger than 12,000 gallons (45 420 L) in capacity storing Class IIB liquids which are not within the diked area or the drainage path of Class I or II liquids do not require emergency relief venting. 2. Emergency vents on protected above-ground tanks complying with UL 2085 containing Class II or IIIA liquids are allowed to discharge inside the building.	Restores reference to NFPA 30. Exposure to an external fire would heat a stationary above-ground tank, generating a greater volume of flammable or combustible liquid vapors in the tank. The increased pressure could damage the tank or piping system, so these tanks are equipped with emergency vents to relieve this additional pressure. To mitigate the hazard that would be created by an indoor tank releasing flammable or combustible liquid vapors into a building that is already involved in a fire, emergency vents for Class I, II and IIIA liquid tanks are required to discharge outside the building.  Recognizing the reduced hazard of Class IIB liquids, Exception 1 provides that stationary above-ground tanks storing more than 12,000 gallons (45 420 L) of Class IIB liquids do not need emergency venting if the tank is not in the same containment area or drainage path as tanks with Class I or II liquids. The high boiling point of Class IIB liquids and the high volume provide a degree of safety before the buildup of internal pressure. With the tank safety features, the volume of Class IIB liquid and having the tank located so that it does not affect tanks storing Class I or II liquids, emergency venting is not required.  Exception 2 recognizes the higher level of protection afforded by a UL 2085-protected above-ground tank storing Class II or IIIA liquid by allowing the emergency vent to discharge inside the building. This is made possible by the fact that UL 2085 tanks are designed and constructed to withstand a 2-hour pool fire test of 2,000°F (1111°C) during which no single point temperature may exceed 400°F (204°C) and the average temperature rise throughout the internal tank can be no greater than 260°F (126.67°C). Given the stringent UL 2085 testing requirements, activation of the emergency vent is likely only under extreme fire conditions over an extended period of time. Further, NFPA 30 requires that emergency vents placed on vent pipes that extend beyond 12 inches (305 mm) from the tank be reengineered to account for the potential back pressure and ensure activation at the appropriate pressure. It is not unusual to see vent lines extending 30 or 40 feet (9.14 or 12.19 m) or more through a building in order to achieve
921	CAAM		5704.2.7.6 Repair, alteration or reconstruction of tanks and piping. The repair, alteration or reconstruction, including welding, cutting and hot tapping of storage tanks and piping that have been placed in service, shall be in accordance with NFPA 30 and the applicable building code. Hot work, as defined in Section 202, on such tanks shall be conducted in accordance with Section 3510.	Restores reference to NFPA 30 and a pointer to the applicable building code for modifications.
922	CA		5704.2.8.5 Anchoring. Vaults and their tanks shall maintain anchoring in accordance with the applicable building code to withstand uplift by ground water or flooding, including when the tank is empty.	Restores technical guidance while pointing back to the applicable building code. The tank and the vault may float if the water tank is high or flooding occurs. The tank is to be anchored to the vault to prevent the tank from floating, while the vault is also to be anchored to prevent it from floating.
923	CA		5704.2.8.9 Ventilation. Where required by the applicable building code, vaults that contain tanks of Class I liquids provided with an exhaust system shall be operated and maintained in accordance with Section 5004.3.	Restores technical guidance as well as reference back to 5004.3.
924	CA		5704.2.8.11 Liquid and vapor detection. Where required by the applicable building code, vaults shall maintain an approved vapor and liquid detection system. Where required by the applicable building code the following arrangements shall be maintained: The system shall be maintained with on-site audible and visual warning devices with battery backup. Vapor detection systems shall be maintained to sound an alarm when the system detects vapors that reach or exceed 25 percent of the lower explosive limit (LEL) of the liquid stored. Where required, liquid detection systems shall be maintained to sound an alarm upon detection of any liquid, including water. Liquid detectors shall be maintained in accordance with the manufacturer's instructions. Where required, activation of either vapor or liquid detection systems shall cause a signal to be sounded at an approved, constantly attended location within the facility serving the tanks or at an approved location. Where required by the applicable building code, activation of vapor detection systems shall also shut off dispenser pumps.	Restores important operational criteria that must be maintained if required.
925	CA		5704.2.9 Above-ground tanks. Above-ground storage of flammable and combustible liquids in tanks shall comply with Section 5704.2 and Sections 5704.2.9.1 through 5704.2.9.7.10.  5704.2.9.1 Existing noncompliant installations. Existing above-ground tanks shall be maintained in accordance with the code requirements that were applicable at the time of installation. Above-ground tanks that were installed in violation of code requirements applicable at the time of installation shall be made code compliant or shall be removed in accordance with Section 5704.2.14.	Restores editorial scoping language for 5704.2.9. Also restores important language for tanks that are in violation of the code requirements that were applicable at the time of installation. Operation of these above-ground tanks, sources of ignition, locations, security, and so on, are covered to ensure a safe facility and operation. For existing, noncompliant above-ground storage tanks that constitute a hazard, such as an underground tank being used above ground, straightforward guidance and a clear-cut authorization, as provided by this section, to remove the tank is needed. These situations are different from an abandoned or out-of-service tank, yet require similar mitigation, such that the removal of such an unsafe tank needs to be in accordance with the safeguards otherwise required.
926	CA		5704.2.9.3 Supports, foundations and anchorage. Supports, foundations and anchorages for above-ground tanks shall be maintained in accordance with NFPA 30 and the applicable building code.	Restored reference to NFPA 30 and the applicable building code for AST supports.
927	CA		5704.2.9.4 Stairways, platforms and walkways. Stairways, platforms and walkways shall be maintained in accordance with NFPA 30 and the applicable building code.	Restored reference to NFPA 30. Provides editorial scoping language for 5704.2.9.5
928	CA		5704.2.9.5 Aboveground tanks inside of buildings. Above-ground tanks inside of buildings shall be maintained in accordance with the applicable building code and Sections 5704.2.9.5.1 and 5704.2.9.5.2.	
929	CA		5704.2.9.5.1 Overfill prevention. Where required by the applicable building code, above-ground tanks storing Class I, II and IIIA liquids inside buildings shall maintain a device or other means to prevent overflow into the building including, but not limited to: a float valve; a preset meter on the fill line; a valve actuated by the weight of the tank's contents; a low-head pump that is incapable of producing overflow; or a liquid-tight overflow pipe at least one pipe size larger than the fill pipe and discharging by gravity back to the outside source of liquid or to an approved location. Where required, tanks containing Class IIB liquids and connected to fuel-burning equipment shall maintain a means to prevent overflow into buildings in accordance with Section 5704.2.7.5.8.	
930	CA		5704.2.9.5.2 Fill pipe connection operations. Where required by the applicable building code, fill pipe connections for tanks storing Class I, II and IIIA liquids and Class IIB liquids connected to fuel-burning equipment shall be maintained in accordance with Section 5704.2.9.7.7.	Changed language from construction to maintenance and operations. Overfilling of tanks containing Class I, II and IIIA liquids inside a building can release vapors that could reach concentrations at or above the LFL. Devices and equipment for filling of these tanks must be designed to prevent spillage and damage to the storage tank.  Note that tanks storing Class IIB liquids and not connected to fuel-burning equipment, such as waste motor oil, are not subject to these requirements due to the higher flash point (lower volatility) and thus the lower relative hazard of the liquid.  Tanks storing Class IIB liquids and connected to fuel-burning equipment, however, are subject to overfill protection requirements in accordance with Section 5704.2.7.5.8 due to the potential for the creation of hazardous conditions as discussed in the commentary to that section.
931	CA		5704.2.9.7.6 Overfill prevention. Protected above-ground tanks shall not be filled in excess of 95 percent of their capacity. Where required by the applicable building code, an overfill prevention system shall be maintained for each tank. During tank-filling operations, the system shall comply with one of the following unless otherwise approved in accordance with the applicable building code: 1. The system shall: 1.1. Provide an independent means of notifying the person filling the tank that the fluid level has reached 90 percent of tank capacity by providing an audible or visual alarm signal, providing a tank level gauge marked at 90 percent of tank capacity, or other approved means; and 1.2. Automatically shut off the flow of fuel to the tank when the quantity of liquid in the tank reaches 95 percent of tank capacity. For rigid hose fuel-delivery systems, an approved means shall be provided to empty the fill hose into the tank after the automatic shutoff device is activated. 2. The system shall reduce the flow rate to not more than 15 gallons per minute (0.95 L/s) so that at the reduced flow rate, the tank will not overflow for 30 minutes, and automatically shut off flow into the tank so that none of the fittings on the top of the tank are exposed to product because of overfilling.	Restores operational requirements for overfill prevention. To prevent spillage during filling, above-ground tanks must be limited to 95 percent of their capacity by an overfill protection system. Several methods are acceptable that provide design flexibility utilizing either an audible or visible alarm when the tank becomes 90-percent full, including draining the fill hose into the above-ground tank without exceeding the 95-percent capacity; an automatic shutoff at 95-percent full; or a means of reducing the fill rate to not more than 15 gallons per minute (gpm) (0.95 L/s) so that, at that reduced flow rate, the tank will not overflow for 30 minutes, after which the fill flow will stop automatically.
932	CA		5704.2.9.7.5.2 Determination of available tank capacity. The filling procedure shall require the person filling the tank to determine the gallonage (literage) required to fill it to 90 percent of capacity before commencing the fill operation.	Restores operational requirements. As an additional safety measure, the filling procedure is to include a requirement that the operator determine the gallonage (literage) required to fill the tank to 90-percent capacity before commencing the operation.
933	CA		5704.2.9.7.6 Fill pipe connections. Where required by the applicable building code, the fill pipe shall be maintained with a means for making a direct connection to the tank vehicle's fuel delivery hose so that the delivery of fuel is not exposed to the open air during the filling operation.	Restores operational requirements. To control spillage during filling, a spill container is to be provided for each above-ground tank. The spill container must have a top fill connection, be noncombustible and be permanently fixed to the tank. This spill container is to drain directly into the aboveground tank. A remote fill connection can use a portable spill container.
934	CA		5704.2.11.1 Underground tanks. Underground storage of flammable and combustible liquids in tanks shall comply with Section 5704.2 and Sections 5704.2.11.1 through 5704.2.11.4.2.	Restores editorial scoping language for the following subsections. Underground tanks are exposed to conditions not associated with above-ground tanks. Leakage of flammable and combustible liquids is harder to detect. Protection from loads being placed on top of or adjacent to the underground tank is needed to prevent damage to the underground tank. The underground tank must be protected from flooding and from floating in areas having a groundwater table that may be above the bottom of the underground tank.
935	CA		5704.2.11.3 Overfill protection and prevention systems. Fill pipes shall be equipped with a spill container and, where required by the applicable building code, an overfill prevention system in accordance with NFPA 30.	Restores operational requirement for spill container and reference to NFPA 30 for overfill protection.
936	CA		5704.2.11.4 Leak prevention. Leak prevention for underground tanks shall be maintained in accordance with the applicable building code and Sections 5704.2.11.4.1 and 5704.2.11.4.2.	Leakage from underground tanks is to be detected by either monitoring or an approved leak detection system.
937	CA		5704.2.11.4.2 Leak detection. Where required by the applicable building code, underground storage tank systems shall maintain an approved method of leak detection from any component of the system that is designed and installed in accordance with NFPA 30.	Leakage detection systems must be maintained in accordance with NFPA 30.
938	CA		5704.3.3.5 Shelf storage. Shelving shall be of approved construction, adequately braced and anchored. Seismic requirements shall be in accordance with the applicable building code.	Shelf storage is not regulated by the building code. Shelving for containers and portable tanks is to be adequate to support the container and portable tank under normal loads and seismic loads. Failure of shelving could cause damage to containers and portable tanks or leakage.
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510	CA	5704.3.3.6 Rack storage. Where storage on racks is allowed by the applicable building code and elsewhere in this code, a minimum 4-foot (1219 mm) aisle shall be maintained between adjacent rack sections and any adjacent storage of liquids unless otherwise approved by the applicable building code. Main aisles shall be a minimum of 8 feet (2438 mm) wide unless otherwise approved by the applicable building code.	5704.3.3.5.1 Use of wood. Wood of at least 1 inch (25 mm) nominal thickness is allowed to be used as shelving, racks, <del>dunnage</del> , <del>scuffboards</del> , <del>floor overlay</del> and similar installations. 5704.3.3.6 Rack storage. Where storage on racks is allowed by the applicable building code and elsewhere in this code, a minimum 4-foot-wide (1219 mm) aisle shall be maintained between adjacent rack sections and any adjacent storage of liquids. Main aisles shall be a minimum of 8 feet (2438 mm) wide.	Shelf storage is not regulated by the building code. Operational maintenance of aisle widths. Rack storage indicates that a larger quantity of flammable and combustible liquids is available for use. Requiring a minimum aisle width of 4 feet (1219 mm) between racks and a minimum main aisle width of 8 feet (2438 mm) provides room to access the flammable and combustible liquids while reducing interference with other racks or other containers and portable tanks. In case of a fire, these aisles are wide enough to give emergency response personnel ready access to the fire and also serve as fire breaks that help prevent fire spread from rack to rack.
511	CAAM			
512	CA	5704.3.4.1 Maximum allowable quantity per control area. For occupancies other than Group M wholesale and retail sales uses, indoor storage of flammable and combustible liquids exceeding the maximum allowable quantities per control area indicated in the applicable building code or the additional limitations set forth in this section shall be approved by the Building Official in accordance with the applicable building code. For Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in the applicable building code unless approved by the Building Official in accordance with the applicable building code. Storage of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with Chapter 27 and the applicable building code.	5704.3.4.1 Maximum allowable quantity per control area. For occupancies other than Group M wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall exceeding the maximum allowable quantities per control area indicated in Table 5003.1.1(1) or the additional limitations set forth in this section shall be approved by the Building Official in accordance with the applicable building code. For Group M occupancy wholesale and retail sales uses, indoor storage of flammable and combustible liquids shall not exceed the maximum allowable quantities per control area indicated in Table 5704.3.4.1 unless approved by the Building Official in accordance with the applicable building code. Storage of hazardous production material flammable and combustible liquids in Group H-5 occupancies shall be in accordance with Chapter 27 and the applicable building code.	Restored editorial scoping language for the following subsections. The quantity of flammable and combustible liquids in an area is limited to reduce the potential fire hazard. Adjusted the language to indicate that quantities exceeding the MAQ require approval by the Building Official. Whereas Table 5003.1.1(1) lists the MAQs for occupancies other than Group M, Table 5704.3.4.1 lists the flammable and combustible liquid MAQ for Group M occupancies. The term "wholesale" is intended to eliminate the question as to whether Group M provisions apply to stores where goods are displayed and sold in bulk packaging or where bulk-packaged merchandise is kept above customer displays, such as in the popular big-box home-improvement centers and "club" stores. Conversely, these provisions would not apply to a storage warehouse with a customer service counter or similar arrangement. Such facilities should be regulated using standard MAQs for occupancies other than Group M and would not qualify for the special MAQs of this section. It is very important to note that any time the special MAQs for Group M wholesale and retail sales uses are applied, the limitations on container types, capacities, fire protection and storage arrangements in Section 5704.3.6 must be applied.
513	CAAM			
514	CA	Table to remain deleted	TABLE 5704.3.4.1 MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF FLAMMABLE AND COMBUSTIBLE LIQUIDS IN WHOLESALE AND RETAIL SALES OCCUPANCIES	Restores reference to table data for wholesale and retail sales.
515	CAAM	5704.3.4.2 Occupancy quantity limits. The following limits for quantities of stored flammable or combustible liquids shall not be exceeded unless approved by the Building Official in accordance with the applicable building code: 1. Group A occupancies: Quantities in Group A occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 2. Group B occupancies: Quantities in drinking, dining, office and school uses within Group B occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 3. Group E occupancies: Quantities in Group E occupancies shall not exceed that necessary for demonstration, treatment, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 4. Group F occupancies: Quantities in dining, office, and school uses within Group F occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 5. Group I occupancies: Quantities in Group I occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 6. Group M occupancies: Quantities in dining, office, and school uses within Group M occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. The maximum allowable quantities for storage in wholesale and retail sales areas shall be in accordance with Section 5704.3.4.1. 7. Group R occupancies: Quantities in Group R occupancies shall not exceed that necessary for maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code. 8. Group S occupancies: Quantities in dining and office uses within Group S occupancies shall not exceed that necessary for demonstration, laboratory work, maintenance purposes and operation of equipment, and shall not exceed quantities set forth in the applicable building code.		Restored key exceptions to quantity limits while maintaining that quantities above the MAQ must be approved by the Building Official in accordance with the applicable building code.
516	CAAM	5704.3.4.3 Quantities exceeding limits for control areas. Where required by the applicable building code quantities exceeding those allowed in control areas set forth in Section 5704.3.4.1 shall be in liquid storage rooms or liquid storage warehouses approved by the Building Official in accordance with Sections 5704.3.7, 5704.3.8, and the applicable building code. 5704.3.4.4 Liquids for maintenance and operation of equipment. In all occupancies, quantities of flammable and combustible liquids in excess of 10 gallons (38 L) used for maintenance purposes and the operation of equipment shall be stored in liquid storage cabinets in accordance with Section 5704.3.2. Quantities not exceeding 10 gallons (38 L) are allowed to be stored outside of a cabinet when in approved containers located in private garages or other approved locations.	5704.3.4.3 Quantities exceeding limits for control areas. Quantities exceeding those allowed in control areas set forth in Section 5704.3.4.1 shall be in liquid storage rooms or liquid storage warehouses approved by the Building Official in accordance with the applicable building code. 5704.3.4.4 Liquids for maintenance and operation of equipment. In all occupancies, quantities of flammable and combustible liquids in excess of 10 gallons (38 L) used for maintenance purposes and the operation of equipment shall be stored in liquid storage cabinets in accordance with Section 5704.3.2. Quantities not exceeding 10 gallons (38 L) are allowed to be stored outside of a cabinet when in approved containers located in private garages or other approved locations.	
517	CA	5704.3.5 Storage in control areas. Storage of flammable and combustible liquids in control areas shall be in accordance with Sections 5704.3.5.1 through 5704.3.5.4.	5704.3.5 Storage in control areas. Storage of flammable and combustible liquids in control areas shall be in accordance with Sections 5704.3.5.1 through 5704.3.5.4.	Restores editorial scoping language for the following subsections. The location of flammable and combustible liquids in a control area can increase the fire hazard.
518	CAAM	5704.3.5.1 Basement storage. Class I, II and IIIA liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity per control area for use-open systems when approved by the Building Official in accordance with the applicable building code.	5704.3.5.1 Basement storage. Class I liquids shall be allowed to be stored in basements in amounts not exceeding the maximum allowable quantity per control area for use-open systems in Table 5003.1.1(1), when approved by the Building Official in accordance with the applicable building code. Class II and IIIA liquids shall also be allowed to be stored in basements, when approved by the Building Official in accordance with the applicable building code.	Restores the technical criteria while pointing to the Building Official for approval. The storage of Class I liquids in basements in amounts not exceeding the MAQ in Table 5003.1.1(1) (including the increases allowed by the table notes) is allowed by this section. Since storage is typically thought to be a safer condition than any use condition (no transport, no transfer, and so on, storage in a basement of amounts at least equal to what is allowed for use-open system MAQs in a basement (Section 5705.3.7.2) is allowed. This reflects actual practice in the field with no known loss experience indicating that it has been a problem. Compliance with control area requirements must still be achieved, the MAQ limitations must still apply and the basement must be provided with a fire suppression system and other required protection called for in Chapter 9. It also enhances the level of safety by eliminating the need to transport Class I liquids vertically in buildings (out of the basement) after use is complete. Class II and IIIA liquids are also permitted in a basement provided with a fire suppression system and other required protection called for in the building code.
519	CAAM	5704.3.7.2.2 Separation and aisles. Unless otherwise approved in accordance with the applicable building code, separation and aisles shall comply with this section. Piles shall be separated from each other by at least 4-foot (1219 mm) aisles. Aisles shall be provided so that all containers are 20 feet (6096 mm) or less from an aisle. Where the storage of liquids is on racks, a minimum 4-foot-wide (1219 mm) aisle shall be provided between adjacent rows of racks and adjacent storage of liquids. Main aisles shall be a minimum of 8 feet (2438 mm) wide. Additional aisles shall be maintained for access to doors, required windows and ventilation openings, standpipe connections, mechanical equipment and switches. Such aisles shall be at least 3 feet (914 mm) in width, unless greater widths are required for separation of piles or racks, in which case the greater width shall be provided.	5704.3.7.2.2 Separation and aisles. Unless otherwise approved in accordance with the applicable building code, piles shall be separated from each other by at least 4-foot (1219 mm) aisles. Aisles shall be provided so that all containers are 20 feet (6096 mm) or less from an aisle. Where the storage of liquids is on racks, a minimum 4-foot-wide (1219 mm) aisle shall be provided between adjacent rows of racks and adjacent storage of liquids. Main aisles shall be a minimum of 8 feet (2438 mm) wide. Additional aisles shall be provided for access to doors, required windows and ventilation openings, standpipe connections, mechanical equipment and switches. Such aisles shall be at least 3 feet (914 mm) in width, unless greater widths are required for separation of piles or racks, in which case the greater width shall be provided.	Pile and storage arrangements are typically not regulated by the building code so this section provided technical guidance for proper storage. Aisles in a liquid storage room are to be maintained to the same aisle criteria as for rack storage. A minimum aisle width of 4 feet (1219 mm) between piles and a minimum main aisle of 8 feet (2438 mm) is to provide clearance for personnel to access the flammable and combustible liquids without interference with other piles.
520	CAAM	5704.3.7.3 Spill control and secondary containment. Where provided or required by the applicable building code liquid storage rooms shall maintain spill control and secondary containment in accordance with Section 5004.2 and the applicable building code. 5704.3.7.4 Ventilation. Where provided or required by the applicable building code liquid storage rooms shall be ventilated in accordance with Section 5004.3 and the applicable building code. 5704.3.7.5 Fire protection. Fire protection for liquid storage rooms shall comply with the applicable building code and Sections 5704.3.7.5.1 and 5704.3.7.5.2.	5704.3.7.3 Spill control and secondary containment. Liquid storage rooms shall maintain spill control and secondary containment in accordance with Section 5004.2 and the applicable building code. 5704.3.7.4 Ventilation. Liquid storage rooms shall be ventilated in accordance with Section 5004.3 and the applicable building code. 5704.3.7.5 Fire protection. Fire protection for liquid storage rooms shall comply with the applicable building code and Sections 5704.3.7.5.1 and 5704.3.7.5.2.	Restores reference to associated sections as well as indicating compliance with the applicable building code.
521	CA	5704.3.7.5.1 Fire-extinguishing systems for liquid storage rooms shall be maintained in accordance with Chapter 9 and the applicable building code.	5704.3.7.5.1 Fire-extinguishing systems for liquid storage rooms shall be maintained in accordance with Chapter 9 and the applicable building code.	
522	CAAM	5704.3.8 Liquid storage warehouses. Buildings used for storage of flammable or combustible liquids in quantities exceeding those set forth in Section 5704.3.4 for control areas and Section 5704.3.7 for liquid storage rooms shall be approved by the Building Official in accordance with the applicable building code. 5704.3.8.1 Quantities and storage arrangement. The total quantities of liquids in a liquid storage warehouse shall not be limited unless otherwise limited by the applicable building code. Unless otherwise approved by the applicable building code, the arrangement of storage shall be in accordance with Table 5704.3.6.3(2) or 5704.3.6.3(3).	5704.3.8 Liquid storage warehouses. Buildings used for storage of flammable or combustible liquids in quantities exceeding those set forth in Section 5704.3.4 for control areas and Section 5704.3.7 for liquid storage rooms shall be approved by the Building Official in accordance with the applicable building code. 5704.3.8.1 Quantities and storage arrangement. The total quantities of liquids in a liquid storage warehouse shall not be limited unless otherwise approved by the applicable building code. The arrangement of storage shall be in accordance with the applicable building code and Table 5704.3.6.3(2) or 5704.3.6.3(3).	Provides additional guidance regarding the arrangement of storage in liquid storage warehouses.
523	CA	5704.3.8.1.1 Mixed storage. Mixed storage shall be in accordance with Section 5704.3.7.2.1 unless otherwise required by the applicable building code. 5704.3.8.1.2 Separation and aisles. Separation and aisles shall be in accordance with Section 5704.3.7.2.2 unless otherwise required by the applicable building code.	5704.3.8.1.1 Mixed storage. Mixed storage shall be in accordance with Section 5704.3.7.2.1 unless otherwise required by the applicable building code. 5704.3.8.1.2 Separation and aisles. Separation and aisles shall be in accordance with Section 5704.3.7.2.2 unless otherwise required by the applicable building code.	Additional guidance for storage arrangements in liquid storage warehouses.
524	CAAM	5704.3.8.2 Spill control and secondary containment. Liquid storage warehouses shall maintain spill control and secondary containment as set forth in Section 5004.2 and the applicable building code. 5704.3.8.3 Ventilation. Ventilation for liquid storage warehouses storing containers greater than 5 gallons (19 L) in capacity shall be operated and maintained in accordance with the applicable building code. 5704.3.8.4 Fire-extinguishing systems. Automatic sprinkler systems for liquid storage warehouses shall be maintained in accordance with Chapter 9 and the applicable building code.	5704.3.8.2 Spill control and secondary containment. Liquid storage warehouses shall maintain spill control and secondary containment as set forth in Section 5004.2 and the applicable building code. 5704.3.8.3 Ventilation. Liquid storage warehouses storing containers greater than 5 gallons (19 L) in capacity shall be ventilated in accordance with the applicable building code. 5704.3.8.4 Fire-extinguishing systems. Liquid storage warehouses shall maintain an automatic sprinkler systems in accordance with Chapter 9 and the applicable building code.	Minor changes and additional references to maintenance requirements.
525	CAAM	5704.3.8.5 Warehouse hose lines. Where provided or required by the applicable building code, in liquid storage warehouses other than 1 1/2-inch (38 mm) lined or 1-inch (25 mm) hard rubber hand hose lines shall be maintained in sufficient number to reach all liquid storage areas and shall be maintained in accordance with Chapter 9.	5704.3.8.5 Warehouse hose lines. Unless otherwise required by the fire code official, in liquid storage warehouses other than 1 1/2-inch (38 mm) lined or 1-inch (25 mm) hard rubber hand hose lines shall be maintained in sufficient number to reach all liquid storage areas and shall be maintained in accordance with Chapter 9.	Restores the option for maintaining hose lines when approved by the fire code official. The requirements for hose lines stated in this section are consistent with the requirements of Chapter 9.

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956	CAAM	5704.4.3 Spill control and secondary containment. Where provided in accordance with the applicable building code, spill control and secondary containment for storage areas shall be maintained in accordance with Section 5703.4 and the applicable building code. Exception: Containers stored on approved containment pallets in accordance with Section 5004.2.3 and containers stored in cabinets and lockers with integral spill containment.	5704.4.3 Spill control and secondary containment. Storage areas shall be provided with spill control and secondary containment in accordance with Section 5703.4 and the applicable building code. Exception: Containers stored on approved containment pallets in accordance with Section 5004.2.3 and containers stored in cabinets and lockers with integral spill containment.	Restored the reference to maintenance requirements as well as the exception.
957	CA	5705.3.6.2.3 Solvent quantity limits. Solvent quantities shall be limited in accordance with the applicable building code.	5704.4.7 Weather protection. Weather protection for outdoor storage shall be maintained in accordance with Section 5004.13 and the applicable building code.	Weather protection is not required for outdoor storage; however, where an overhead structure is erected, it must conform to the requirements of Section 5004.13. The code reference notes that an open structure consisting of only a noncombustible roof structure does not change the storage facility to indoor storage. Natural airflow through a structure with no walls and only a noncombustible roof has sufficient ventilation for the storage area to be treated as outdoor storage for flammable and combustible liquids.
958	CAAM	5705.3.6.2.3 Solvent quantity limits. Solvent quantities shall be limited in accordance with the applicable building code.	5705.3.6.2.3 Solvent quantity limits. Solvent quantities shall be limited as follows: 1. Machines with remote solvent reservoirs shall be limited to quantities set forth in Section 5705.3.5. 2. Machines with remote solvent reservoirs using Class I liquids shall be limited to quantities set forth in Section 5705.3.5. 3. Machines with remote solvent reservoirs using Class II liquids shall be limited to 35 gallons (132 L) per machine. The total quantities shall not exceed an aggregate of 240 gallons (908 L) per control area in buildings not equipped throughout with an approved automatic sprinkler system and an aggregate of 480 gallons (1817 L) per control area in buildings equipped throughout with an approved automatic sprinkler system in accordance with the NFPA 13 of the applicable building code. 4. Machines with remote solvent reservoirs using Class IIA liquids shall be limited to 80 gallons (303 L) per machine.	Simply added NFPA 13 reference for clarity. This section lists four restrictions on solvent quantities in machines:  1.A machine without a remote solvent reservoir is under the quantity limitations for a control area. The quantity of solvent in the machine and any other flammable and combustible liquids in the control area cannot exceed the maximum quantity permitted under Table 5003.1.1(1). These quantities can be increased by the application of Section 5705.3.5.3.  2.A machine with a remote solvent reservoir using Class IB or IC liquids is treated the same as a machine without a remote solvent reservoir.  3.A machine with a remote solvent reservoir using Class II liquid is permitted to have larger quantities than Table 5003.1.1(1) allows. The allowable quantity is increased even more if the control area has an automatic sprinkler system. The safety features built into the machine permit the increase in Class II solvent quantities for each machine and for the control area.  4.A machine with a remote solvent reservoir using Class IIA liquid is permitted to have 80 gallons (303 L) per machine.
959	CA	5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following: 1. The maximum capacity of each dispenser shall be 68 ounces (2 L). 2. The minimum separation between dispensers shall be 48 inches (1219 mm). 3. The dispensers shall not be installed above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening countertop shall be free of electrical receptacles, switches, appliances, devices or other ignition sources. 4. Dispensers shall be mounted so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor. 5. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "touch free" alcohol-based hand-rub dispensing devices with the following requirements: 5.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions. 5.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features: 5.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device. 5.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the U.S. Food and Drug Administration (USFDA). 5.2.3. An object placed within the activation zone and left in place will cause only one activation. 6. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705. 7. Dispensers installed in occupancies with carpeted floors shall only be allowed in smoke compartments or fire areas equipped throughout with an approved automatic sprinkler system in accordance with NFPA 13 or NFPA 13R of the applicable building code.	5705.5 Alcohol-based hand rubs classified as Class I or II liquids. The use of wall-mounted dispensers containing alcohol-based hand rubs classified as Class I or II liquids shall be in accordance with all of the following: 1. The maximum capacity of each dispenser shall be 68 ounces (2 L). 2. The minimum separation between dispensers shall be 48 inches (1219 mm). 3. The dispensers shall not be installed above, below, or closer than 1 inch (25 mm) to an electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor or intervening countertop shall be free of electrical receptacles, switches, appliances, devices or other ignition sources. 4. Dispensers shall be mounted so that the bottom of the dispenser is not less than 42 inches (1067 mm) and not more than 48 inches (1219 mm) above the finished floor. 5. Dispensers shall not release their contents except when the dispenser is manually activated. Facilities shall be permitted to install and use automatically activated "touch free" alcohol-based hand-rub dispensing devices with the following requirements: 5.1. The facility or persons responsible for the dispensers shall test the dispensers each time a new refill is installed in accordance with the manufacturer's care and use instructions. 5.2. Dispensers shall be designed and must operate in a manner that ensures accidental or malicious activations of the dispensing device are minimized. At a minimum, all devices subject to or used in accordance with this section shall have the following safety features: 5.2.1. Any activations of the dispenser shall only occur when an object is placed within 4 inches (98 mm) of the sensing device. 5.2.2. The dispenser shall not dispense more than the amount required for hand hygiene consistent with label instructions as regulated by the U.S. Food and Drug Administration (USFDA). 5.2.3. An object placed within the activation zone and left in place will cause only one activation. 6. Storage and use of alcohol-based hand rubs shall be in accordance with the applicable provisions of Sections 5704 and 5705. 7. Dispensers installed in occupancies with carpeted floors shall only be allowed in smoke compartments or fire areas equipped throughout with an approved automatic sprinkler system in accordance with NFPA 13 or NFPA 13R of the applicable building code.	Added NFPA 13 and 13R reference for clarity. Alcohol-based hand rubs are essential in health care occupancies for controlling the spread of unwanted infectious microorganisms. Numerous studies conducted on their use have found that they provide a vastly improved efficacy against numerous pathogens and are more effective for a longer time period when compared to simple handwashing with soap and water.
960	CA	5705.5.1 Corridor installations. Where wall-mounted dispensers containing alcohol-based hand rubs are installed in corridors, they shall be in accordance with all of the following: 1. Level 2 and 3 aerosol containers shall not be allowed in corridors. 2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg). 3. The maximum quantity allowed in a corridor within a control area shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one. 4. The minimum corridor width shall be 72 inches (1829 mm). 5. Projections into a corridor shall be in accordance with the applicable building code.	5705.5.1 Corridor installations. Where wall-mounted dispensers containing alcohol-based hand rubs are installed in corridors, they shall be in accordance with all of the following: 1. Level 2 and 3 aerosol containers shall not be allowed in corridors. 2. The maximum capacity of each Class I or II liquid dispenser shall be 41 ounces (1.21 L) and the maximum capacity of each Level 1 aerosol dispenser shall be 18 ounces (0.51 kg). 3. The maximum quantity allowed in a corridor within a control area shall be 10 gallons (37.85 L) of Class I or II liquids or 1135 ounces (32.2 kg) of Level 1 aerosols, or a combination of Class I or II liquids and Level 1 aerosols not to exceed, in total, the equivalent of 10 gallons (37.85 L) or 1,135 ounces (32.2 kg) such that the sum of the ratios of the liquid and aerosol quantities divided by the allowable quantity of liquids and aerosols, respectively, shall not exceed one. 4. The minimum corridor width shall be 72 inches (1829 mm). 5. Projections into a corridor shall be in accordance with the applicable building code.	They are portable devices not regulated by the building code. Though these provisions are not occupancy specific, in health care occupancies, hand-rub dispensers are often located in the patient room. But due to a variety of clinical issues, including patient population (psychiatric and pediatric patients), care delivery models (teaching hospitals with multiple residents in contact with patients) and patient room space constraints (lack of available space for mounting a dispenser away from constricted traffic flow, electric outlets and electric switches), mounting the dispenser in the patient room may not be possible or may compromise effective patient care. In these instances, dispensers mounted in the corridor best meet the clinical needs.  Because of life safety hazards in health care occupancies, various medical professional associations approached the ASHPE to address the challenge of understanding and, if possible, allowing the installation of a number of dispensers containing a small quantity of alcohol-based hand rubs (Class 1B flammable liquid) in egress corridors of health care facilities. Concerned that the introduction of alcohol-based hand rubs may simply be reducing one risk while creating another (fire safety), ASHPE responded by investigating the current use of alcohol-based hand rub solutions and analyzing the risks presented by them. The ad hoc committee reviewed the results of the fire modeling in corridors and recommended the five safeguards contained in this section.
961	CAAM	5706.2.6 Spill control drainage control and diking. Where provided or required by the applicable building code indoor storage and dispensing areas shall be maintained with spill control and drainage control as set forth in Section 5703.4. Where provided or required by the applicable building code outdoor storage areas shall be maintained with drainage control or diking as set forth in Section 5704.2.10.	5706.2.6 Spill control drainage control and diking. Indoor storage and dispensing areas shall be maintained with spill control and drainage control as set forth in Section 5703.4 and the applicable building code. Outdoor storage areas shall be provided with drainage control or diking as set forth in Section 5704.2.10 and the applicable building code.	Restored references to maintenance requirements. Indoor above-ground storage tanks must be maintained to control leaks and spills to prevent the spread of liquid and vapors.  Outdoor above-ground storage tanks must use dikes and drainage to control leaks or spills from a tank. The flammable and combustible liquids must be collected in a manner that will not endanger other tanks, properties or waterways.  The fire code official has the authority to consider installations where the use of drainage and dikes may not be necessary, such as listed secondary containment tanks in lieu of drainage control or dikes. The secondary containment system in these tanks is considered equivalent to drainage and diking.
962	CA	5706.3.3 Sumps. Sumps associated with wells shall comply with Sections 5706.3.3.1 through 5706.3.3.3.	5706.3.3 Sumps. Sumps associated with wells shall comply with Sections 5706.3.3.1 through 5706.3.3.3.	Restores editorial scoping language for the following subsections. Sumps and basins may be necessary to temporarily store drilling materials that may contain petroleum products. The use of sumps and basins is regulated to control their size, service life and security.
963	CA	5706.3.3.3 Security. Sumps, diversion ditches and depressions used as sumps shall be securely fenced or covered.	5706.3.3.3 Security. Sumps, diversion ditches and depressions used as sumps shall be securely fenced or covered.	Security is an operational issue. Security for the open storage of oil or petroleum products in sumps, basins and ditches is needed to prevent unauthorized access. Individuals may not realize the hazard presented by this open storage and accidentally introduce ignition sources.
964	CA	5706.4.2 Means of egress. Rooms in which liquids are stored, used or transferred by pumps shall have means of egress maintained in accordance with Chapter 10 and the applicable building code to prevent occupants from being trapped in the event of fire.	5706.4.2 Means of egress. Rooms in which liquids are stored, used or transferred by pumps shall have means of egress maintained in accordance with Chapter 10 and the applicable building code to prevent occupants from being trapped in the event of fire.	Restores the technical provisions to highlight the intent of the requirement.
965	CA	5706.4.4 Ventilation. Ventilation for rooms, buildings and enclosures in which Class I liquids are pumped, used or transferred shall be operated and maintained in accordance with the applicable building code. When natural ventilation is inadequate, mechanical ventilation shall be provided in accordance with the applicable building code.	5706.4.4 Ventilation. Ventilation for rooms, buildings and enclosures in which Class I liquids are pumped, used or transferred shall be operated and maintained in accordance with the applicable building code. When natural ventilation is inadequate, mechanical ventilation shall be provided in accordance with the applicable building code.	Restores guidance regarding the use of natural ventilation. The low flash point for Class I liquids requires that where Class I liquid is present, the area is to be ventilated to prevent the accumulation of a vapor-air mixture above the LFL. Ventilation can be either mechanical or natural. Because the vapors from Class I liquids are heavier than air, the ventilation must remove the air at the floor level. Natural ventilation must be to the outdoors.
966	CAAM	5706.4.9 Drainage control. Loading and unloading areas shall be maintained with drainage control in accordance with Section 5704.2.10 and the applicable building code.	5706.4.9 Drainage control. Loading and unloading areas shall be provided with drainage control in accordance with Section 5704.2.10 and the applicable building code.	Restored the reference to 5704.2.10. Flammable and combustible liquids that leak or spill from a tank must be controlled by dikes and drainage. The flammable and combustible liquids are to be collected in a manner that will not endanger other tanks, properties or waterways. Listed secondary containment tanks need not be surrounded by drainage control or dikes. The secondary containment system in these tanks is considered equivalent to drainage and diking.
967	CA	5706.4.10 Fire protection. Fire protection for bulk plants or terminals shall be maintained in accordance with Chapter 9, Sections 5706.4.10.1 through 5706.4.10.4 and the applicable building code.	5706.4.10 Fire protection. Fire protection for bulk plants or terminals shall be maintained in accordance with Chapter 9, Sections 5706.4.10.1 through 5706.4.10.4 and the applicable building code.	Restored the reference to Chapter 9 and the following subsections.
968	CAAM	5706.5.1.2 Weather protection canopies. Where weather protection canopies are provided, they shall be approved by the building official and maintained in accordance with Section 5004.13 and the applicable building code.	5706.5.1.2 Weather protection canopies. Where weather protection canopies are provided, they shall be maintained in accordance with Section 5004.13 and the applicable building code. Unless otherwise approved in accordance with the applicable building code, weather protection canopies shall not be located within 15 feet (4572 mm) of a building or combustible material or within 25 feet (7620 mm) of building openings, lot lines, public streets, public alleys or public ways.	Restored operational placement criteria for weather protection canopies. Also restored the reference to 5706.3.7.5.1
969	CAAM	5706.5.1.3 Ventilation. Ventilation shall be operated and maintained to prevent accumulation of vapors in accordance with the applicable building code.	5706.5.1.3 Ventilation. Ventilation shall be operated and maintained to prevent accumulation of vapors in accordance with Section 5706.3.7.5.1 and the applicable building code.	Restored references to maintenance requirements. Where flammable or combustible liquids are present, spills must be controlled to prevent the spread of liquid and vapors. The diked area must have sufficient capacity to contain the largest spillage of flammable and combustible liquids that can be released from the largest tank. This would be the volume of the largest tank that extends above the top of the dike.
970	CAAM	5706.5.1.5 Spill control and secondary containment. Areas where transfer operations are located shall be maintained with spill control and secondary containment in accordance with the applicable building code.	5706.5.1.5 Spill control and secondary containment. Areas where transfer operations are located shall be maintained with spill control and secondary containment in accordance with Section 5703.4 and the applicable building code.	Restored references to maintenance requirements. Where flammable or combustible liquids are present, spills must be controlled to prevent the spread of liquid and vapors. The diked area must have sufficient capacity to contain the largest spillage of flammable and combustible liquids that can be released from the largest tank. This would be the volume of the largest tank that extends above the top of the dike.
971	CA	5706.5.1.6 Fire protection. Fire protection shall be maintained in accordance with Chapter 9, Section 5703.2 and the applicable building code.	5706.5.1.6 Fire protection. Fire protection shall be maintained in accordance with Chapter 9, Section 5703.2 and the applicable building code.	Restored the reference to Chapter 9, Section 5703.2 and the applicable building code.

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		5803.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of flammable gases in amounts not exceeding the maximum allowable quantity per control area in accordance with the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5801 and 5803.	5803.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of flammable gases in amounts not exceeding the maximum allowable quantity per control area shall be maintained in accordance with Sections 5001, 5003, 5801 and 5803.	Provides guidance as to what particular sections apply. This instruction is removed in the current version. When the amounts stored or used do not exceed the maximum allowable quantities per control area (MAQs), certain factors that must be adhered to include systems and processes, release of hazardous materials into the air, Material Safety Data Sheets (MSDS), hazard identification signs, and sources of ignition requirements.
973	CAAM	5803.1.1.2 Aggregate quantity. The aggregate quantities of flammable gases used for maintenance purposes and operation of equipment shall be maintained as to not exceed the maximum allowable quantity per control area indicated in the applicable building code.	5803.1.1.2 Aggregate quantity. The aggregate quantities of flammable gases used for maintenance purposes and operation of equipment shall be maintained as to not exceed the maximum allowable quantity per control area indicated in Table 5003.1.1(1) and the applicable building code.	Restored proper reference to the MAQ for quantities used for maintenance and equipment purposes. Table 5003.1.1(1) and the applicable building code contains categories of storage, use-closed systems and use-open systems. Flammable gas is categorized only in the storage and use-closed systems. Because gas is in closed containers and systems, use-open systems do not apply. The base MAQ for either storage or use-closed systems is 1,000 cubic feet (28 m <sup>3</sup> ); however, increases for sprinklers and using approved storage cabinets may be applied.
974	CAAM	5803.1.5 Electrical. Electrical wiring and equipment shall be maintained in accordance with Chapter 6 and NFPA 70.	5803.1.5 Electrical. Electrical wiring and equipment shall be maintained in accordance with Chapter 6 and NFPA 70.	Restores the reference to Chapter 6 and NFPA 70 for maintenance of electrical equipment.
975	CA	5804.1 Indoor storage. Indoor storage of flammable gases in amounts exceeding the maximum allowable quantity per control area in accordance with the applicable building code, shall be maintained in accordance with Sections 5001, 5003 and 5004, this chapter, and the applicable building code.	5804.1 Indoor storage. Indoor storage of flammable gases in amounts exceeding the maximum allowable quantity per control area, shall be maintained in accordance with Sections 5001, 5003 and 5004, and this chapter and approved in accordance with the applicable building code.	Provides guidance for when quantities exceed the MAQ. The current language does not provide any guidance. Sections 5003.1 through 5003.11 give the requirements for the indoor storage of flammable gases; equipment, maintenance, markings and signs.
976	CAAM	5804.1.1 Explosion control. Buildings or portions thereof containing flammable gases and provided with explosion control shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code.	5804.1.1 Explosion control. Buildings or portions thereof containing flammable gases and provided with explosion control shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code.	Changes construction language to maintenance language for explosion control systems.
977	CA	5808.2 Limitations. Storage of flammable cryogenic fluids in stationary containers outside of buildings may be subject to local ordinances or other regulations.	5808.2 Limitations. Storage of flammable cryogenic fluids in stationary containers outside of buildings may be subject to local ordinances or other regulations.	Restores proper reference to potential local ordinances as noted in the IFC. This section reminds users that there may be an ordinance in the jurisdiction that would limit the location or amount of cryogenic fluid that could be stored outside of buildings. Generally, such restrictions will be based on locations in densely populated areas or similar factors. This section does not limit the amount that can be stored; it is simply a note to the code user to review any local rules or ordinances for restrictions before investing time and money in designing a facility that may not be usable. If such areas do exist in the adopting community, they must be enumerated in the adopting ordinance.
978	CA	5807.1.10 Electrical. Electrical components for metal hydride storage systems shall be maintained in accordance with Chapter 6 and NFPA 70.	5807.1.10 Electrical. Electrical components for metal hydride storage systems shall be maintained in accordance with Chapter 6 and NFPA 70.	Provides reference to Chapter 6 for maintenance of electrical equipment to be consistent with other sections.
979	CA	5808.2 Location. Unless otherwise permitted by the applicable building code, hydrogen fuel gas operations shall not be located below grade.	5808.2 Location. Unless otherwise permitted by the applicable building code, hydrogen fuel gas operations shall not be located below grade.	
980	CA	5808.3 Pressure Control. Unless otherwise approved by the applicable building code hydrogen fuel gas rooms shall maintain a negative pressure in relation to surrounding rooms and spaces. Windows shall remain in accordance with the applicable building code and shall not be able to be opened.	5808.3 Pressure Control. Hydrogen fuel gas rooms shall maintain a negative pressure in relation to surrounding rooms and spaces. Windows shall remain in accordance with the applicable building code and shall not be able to be opened.	Restores critical guidance for where operations are to be conducted to avoid disaster. Restrictions against installation of hydrogen fuel gas rooms below grade are similar to those restricting the location of flammable and combustible liquids in basements. Explosion hazards are the primary concern, and placement of materials that have an ability to cause an explosion in below-grade spaces is not appropriate. Such spaces are more difficult to evacuate, create a fire and explosion hazard to the structure above and are very difficult for the fire department to access.
981	CAAM	5808.4 Exhaust ventilation. Ventilation required for hydrogen fuel gas rooms shall be maintained and operated in accordance with the applicable building code.	5808.4 Exhaust ventilation. Ventilation required for hydrogen fuel gas rooms shall be maintained and operated in accordance with the applicable building code.	Adds operation language in addition to maintenance requirements.
982	CA	5808.5 Gas detection system. Gas detection systems required for hydrogen fuel gas rooms shall be maintained and operated in accordance with the applicable building code.	5808.5 Gas detection system. Gas detection systems required for hydrogen fuel gas rooms shall be maintained and operated in accordance with the applicable building code.	
983	Deleted	Deleted	5808.5.1 System design. (Section deleted)	
984	Deleted	Deleted	5808.5.2 Gas detection system components. (Section deleted)	
985	CAAM	5808.5.3 Operation. Where provided, activation of the gas detection system shall occur as designed and approved under the applicable building code. At no time shall the level of flammable gas exceed 25 percent lower flammable limit (LFL) and the system shall be maintained to result in both of the following: 1. Initiation of distinct audible and visual alarm signals both inside and outside of the hydrogen fuel gas room. 2. Activation of the mechanical exhaust ventilation system.	5808.5.3 Operation. Where provided, activation of the gas detection system shall occur when the level of flammable gas exceeds 25 percent lower flammable limit (LFL) and be maintained to result in both of the following: 1. Initiation of distinct audible and visual alarm signals both inside and outside of the hydrogen fuel gas room. 2. Activation of the mechanical exhaust ventilation system.	Continues to delete construction requirements while restoring sections on operations. The local alarm is intended to alert the occupants to an emerging hazardous condition in the vicinity. The monitor control equipment must also initiate operation of the mechanical ventilation system in the event of a leak or rupture in the gaseous hydrogen system to prevent an accumulation of flammable gas. Gas detection systems must be maintained to be self-monitoring and fail-safe in that all safety systems are activated to alert any occupants that a problem exists and to prevent more hydrogen from being generated by any appliances in the room when hazardous conditions cannot be monitored.
986	CAAM	5808.5.4 Failure of the gas detection system. Unless otherwise required by the applicable building code failure of the gas detection system shall result in the activation of the mechanical exhaust ventilation system, cessation of the hydrogen generation and the sounding of a trouble signal in an approved location.	5808.5.4 Failure of the gas detection system. Where a gas detection system is provided, failure of the gas detection system shall result in the activation of the mechanical exhaust ventilation system, cessation of the hydrogen generation and the sounding of a trouble signal in an approved location.	
987	CA	5808.6 Explosion control. Explosion control required for hydrogen fuel gas rooms shall be maintained in accordance with the applicable building code and Chapter 9.	5808.6 Explosion control. Explosion control required for hydrogen fuel gas rooms shall be maintained in accordance with the applicable building code and Chapter 9.	Restores reference to Chapter 9 for maintenance of explosion control systems. The requirements of this section are intended to address the circumstance resulting from a catastrophic failure of the hydrogen fuel gas room. These requirements are the final safeguard in case safety features such as interlocked doors, ventilation and gas detection systems should fail. An ignited hydrogen mixture produces large quantities of heat, causing a rapid expansion of the surrounding air. This can cause a pressure increase in a confined space and a catastrophic failure. Explosion control methods are identified in Section 911 to prevent such a catastrophic failure. The explosion control requirements for gaseous and liquefied hydrogen are consistent with the requirements in Section 6.9 of NFPA 2.
988	CAAM	5808.7 Standby power. Standby power provided for mechanical ventilation and gas detection systems shall be maintained in accordance with Chapter 12 and remain in accordance with the applicable building code.	5808.7 Standby power. Standby power provided for mechanical ventilation and gas detection systems shall be maintained in accordance with Chapter 6 and remain in accordance with the applicable building code.	Restores reference to Chapter 6 for maintenance of standby power. The ventilation system and gas detection system are life safety systems and, therefore, must be dependable. Both safety systems must remain active in the event of a failure of the primary power supply. Hydrogen is a colorless, odorless gas; a release might go undetected if detection systems are not functioning. The accumulation of hydrogen in an unventilated area can lead to mixtures in the flammable range if safety systems and mechanical ventilation systems are not in operation. Section 604 and Chapter 50 address standby power requirements for essential systems. Chapter 50 also allows for systems that are fail-safe in Sections 5004.7.2 and 5005.1.5.1 in hydrogen fuel gas rooms where hydrogen is either generated or stored.
989	CA	5904.1 Indoor storage. Indoor storage of flammable solids in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) and the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and approved in accordance with the applicable building code.	5904.1 Indoor storage. Indoor storage of flammable solids in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) and the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and approved in accordance with the applicable building code.	Clarifies how this chapter is to be used and that review by the building official is required if quantities exceed the MAQ. This section regulates the indoor storage of flammable solids when in excess of the MAQ in buildings or portions of buildings be reviewed and possibly classified as Occupancy Group H. The general and storage requirements of Chapter 50 are applicable in addition to the requirements of this section. Storage of flammable solids inside of structures must comply with Sections 5904.1.1 through 5904.1.3 to prevent exposure to conditions that may result in a fire or explosion.
990	CAAM	5904.1.1 Pile size limits and location. Unless otherwise approved in accordance with the applicable building code, flammable solids stored in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be separated into piles each not larger than 1,000 cubic feet (28 m <sup>3</sup> ).	5904.1.1 Pile size limits and location. Flammable solids stored in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be separated into piles each not larger than 1,000 cubic feet (28 m <sup>3</sup> ).	Restores technical guidance for storage arrangements. Not construction requirements. Storage piles are restricted to 1,000 cubic feet (28 m <sup>3</sup> ) in size to limit the quantity of flammable solids exposed to a single fire and to facilitate fire-fighting operations. Aisles must be provided on all sides to permit access for fire fighting and reduce the likelihood of the spread of fire to adjacent piles if a pile collapse occurs.
991	CAAM	5904.1.2 Aisles. Unless otherwise approved in accordance with the applicable building code, aisle widths between piles shall be maintained to be not less than the height of the piles or 4 feet (1219 mm), whichever is greater.	5904.1.2 Aisles. Aisle widths between piles shall be maintained to be not less than the height of the piles or 4 feet (1219 mm), whichever is greater.	Restores technical guidance for storage arrangements. Not construction requirements. As with all other storage, aisles allow fire response personnel ready access to the immediate area of the fire. The requirement that aisle width depends on pile height acknowledges the effectiveness of physical separation in preventing fire spread as well as making room for more or larger fire-fighting equipment that may be needed to fight fires in large storage piles of flammable solids. Additionally, keeping aisle widths the same as the pile heights reduces the likelihood of the spread of fire to adjacent piles or creating a "domino effect" in the event of a pile collapse, since a pile will generally not tip over intact.
992	CA	5904.1.3 Basement storage. Flammable solids shall not be stored in basements unless approved in accordance with the applicable building code.	5904.1.3 Basement storage. Flammable solids shall not be stored in basements unless approved in accordance with the applicable building code.	Flammable solids are very dangerous when stored in basements and most if not all applicable building codes prohibit such storage. Basement storage is prohibited because of the limited access for fire suppression and ventilation operations in most basements and the hazards associated with the vigorous and persistent fires that can occur in flammable solids.
993	CA	5906.2 Storage of magnesium articles. The storage of magnesium shall comply with Sections 5906.2.1 through 5906.4.3.	5906.2 Storage of magnesium articles. The storage of magnesium shall comply with Sections 5906.2.1 through 5906.4.3.	Restores the scoping and editorial language required for the subsequent subsections.
994	CAAM	5906.2.1 Storage of greater than 50 cubic feet. Unless otherwise approved in accordance with the applicable building code, magnesium storage in quantities greater than 50 cubic feet (1.4 m <sup>3</sup> ) shall be separated from storage of other materials that are either combustible or in combustible containers by aisles with a minimum width of not less than the pile height.	5906.2.1 Storage of greater than 50 cubic feet. Magnesium storage in quantities greater than 50 cubic feet (1.4 m <sup>3</sup> ) shall be separated from storage of other materials that are either combustible or in combustible containers by aisles. Piles shall be separated by aisles with a minimum width of not less than the pile height.	Restores the technical requirements for storage operations, not construction. This is a general citation applicable to all forms of magnesium. As is noted in the following sections, storage requirements and allowable quantities vary with the form of the product being stored.  Isolation of magnesium from other combustible materials of any kind helps reduce the amount of magnesium exposed to a single fire originating outside of the magnesium pile and protects materials outside the magnesium pile from exposure to it. Properly established and maintained aisles provide fire suppression personnel ready access to the immediate area of the fire as well as proper egress circulation in the storage area. The requirement that aisle width depends on pile height acknowledges the effectiveness of physical separation in preventing fire spread.
995	CAAM	5906.2.2 Storage of greater than 1,000 cubic feet. Unless otherwise approved in accordance with the applicable building code, magnesium storage in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be separated into piles not larger than 1,000 cubic feet (28 m <sup>3</sup> ) each. Piles shall be separated by aisles with a minimum width of not less than the pile height. Unless approved by the applicable building code, such storage shall not be located in nonsprinklered buildings of Type III, IV or V construction, as defined in the applicable building code.	5906.2.2 Storage of greater than 1,000 cubic feet. Magnesium storage in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be separated into piles not larger than 1,000 cubic feet (28 m <sup>3</sup> ) each. Piles shall be separated by aisles with a minimum width of not less than the pile height. Unless approved by the applicable building code, such storage shall not be located in nonsprinklered buildings of Type III, IV or V construction, as defined in the applicable building code.	Restores the technical requirements for storage operations, not construction. Again, this is a general citation applicable to all forms of magnesium and establishes the maximum pile size at 1,000 cubic feet (28 m <sup>3</sup> ) of material (see also the discussion in the commentary to Section 5906.2.1). In this scenario, a pile could be approximately 10 feet long by 10 feet wide by 10 feet high (3048 mm by 3048 mm by 3048 mm) with an established aisle width between piles of 10 feet (3048 mm).

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996	CAAM	5906.2.3 Storage in combustible containers or within 30 feet of other combustibles. Unless otherwise approved in accordance with the applicable building code, where stored in nonsprinklered buildings of Type III, IV or V construction as defined in the applicable building code, magnesium shall not be stored in combustible containers or within 30 feet (9144 mm) of other combustibles.	5906.2.3 Storage in combustible containers or within 30 feet of other combustibles. Where stored in nonsprinklered buildings of Type III, IV or V construction as defined in the applicable building code, magnesium shall not be stored in combustible containers or within 30 feet (9144 mm) of other combustibles.	Restores the technical requirements for storage operations, not construction. This section recognizes the increased hazard of storing magnesium in nonsprinklered buildings of Type III, IV and V construction by requiring that any containers used for the storage of magnesium be constructed of noncombustible material to provide a layer of shielding to the magnesium in the event of a fire. To further isolate magnesium piles, reduce the likelihood of fire spread among adjacent piles and enhance the effectiveness of the shielding provided by noncombustible storage containers where used, this section requires a substantial increase in the spatial separation between the magnesium and any other combustible materials. Note that this increased separation is not related to pile height.
997	CAAM	5906.3.1 Indoor storage. Unless otherwise approved in accordance with the applicable building code, indoor storage of pigs, ingots and billets shall only be on floors of noncombustible construction. Piles shall not be larger than 500,000 pounds (226.8 metric tons) each. Piles shall be separated by aisles with a minimum width of not less than one-half the pile height.	5906.3.1 Indoor storage. Indoor storage of pigs, ingots and billets shall only be on floors of noncombustible construction. Piles shall not be larger than 500,000 pounds (226.8 metric tons) each. Piles shall be separated by aisles with a minimum width of not less than one-half the pile height.	Restores the technical requirements for storage arrangements and operations, not construction. This section establishes maximum quantity for single piles, but does not restrict the number of piles that can be located in one building or structure. The requirement for aisles that are at least half the pile height allows adequate clearance for both materials-handling equipment and emergency response equipment and personnel. Where pile heights are kept low, the aisles must still be maintained at a width that will allow for equipment travel between piles. Requiring storage on a noncombustible surface reduces the likelihood that the floor would contribute any fuel or contribute to the spread of a fire involving magnesium.
998	CA	5906.4 Storage of fine magnesium scrap. The storage of scrap magnesium shall comply with Sections 5906.4.1 through 5906.4.3.	5906.4 Storage of fine magnesium scrap. The storage of scrap magnesium shall comply with Sections 5906.4.1 through 5906.4.3.	Restores the code references for the subsequent sections for editorial purposes. The requirements of Sections 5906.4.1 through 5906.4.3 apply to the storage of any quantity of magnesium in the form of scrap chips, fines and dust and the hazards they pose. These less-dense forms of magnesium, typically produced in machine processing and recovered for subsequent reuse, present a substantial fire and explosion risk, which is addressed in the following sections.
999	CA	5906.4.2 Storage of 50 to 1,000 cubic feet. Unless otherwise approved by the applicable building code, storage of fine magnesium scrap in quantities greater than 50 cubic feet (1.4 m <sup>3</sup> ) [six 55-gallon (208 L) steel drums] shall be maintained separated from other occupancies by an open space of at least 50 feet (15 240 mm) or by a fire-resistance rated barrier constructed and approved in accordance with applicable building code.	5906.4.2 Storage of 50 to 1,000 cubic feet. Unless otherwise approved by the applicable building code, storage of fine magnesium scrap in quantities greater than 50 cubic feet (1.4 m <sup>3</sup> ) [six 55-gallon (208 L) steel drums] shall be maintained separated from other occupancies by an open space of at least 50 feet (15 240 mm) or by a fire-resistance rated barrier constructed and approved in accordance with applicable building code.	Restores the technical provisions for storage arrangements and operations, not construction. Because fines are usually wet with coolant from the processing operation, there is a possibility of hydrogen generation. For this reason, fines must be stored in approved steel containers with vented lids to prevent hydrogen buildup. Because there is also a possibility of spontaneous heating of fines, they must be stored separately from combustible materials, including other storage piles of magnesium. The required separation distance is intended to minimize radiant heat transfer between the stored magnesium and other materials and provide a measure of protection against the possibility of spread if a fire occurs.  An alternative to the 20-foot (6069 mm) distance is offered in this section. Essentially, it would allow the use of a 2-hour fire barrier, constructed in accordance with IBC Section 707 and without openings, that extends 30 inches (763 mm) above and to the sides of the storage.
1000	CA	5906.4.3 Storage of greater than 1,000 cubic feet. Storage of fine magnesium scrap in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be maintained separated from all buildings other than those used for magnesium scrap recovery operations by a distance of not less than 100 feet (30 480 mm) unless otherwise approved by the applicable building code.	5906.4.3 Storage of greater than 1,000 cubic feet. Storage of fine magnesium scrap in quantities greater than 1,000 cubic feet (28 m <sup>3</sup> ) shall be maintained separated from all buildings other than those used for magnesium scrap recovery operations by a distance of not less than 100 feet (30 480 mm) unless otherwise approved by the applicable building code.	Restores the technical provisions for storage arrangements and operations, not construction. This section recognizes the increased risk associated with the storage of significant quantities of magnesium fines by establishing a blanket 100-foot (30 480 mm) separation distance to any building that is not specifically part of a magnesium recovery operation.
1001	CAAM	5906.5 Use of magnesium. The use of magnesium shall comply with Sections 5906.5.1 through 5906.5.8 and only be conducted in buildings or structures approved for that use in accordance with the applicable building code.  5906.5.1 Melting pots. Floors under and around melting pots shall be of noncombustible construction.  5906.5.2 Heat-treating ovens. Approved means shall be provided for control of magnesium fires in heat-treating ovens.  5906.5.3 Dust collection. Where provided, magnesium grinding, buffing and wire-brushing operations, other than rough finishing of castings, shall be conducted with approved hoods or enclosures for dust collection in accordance with the applicable building code.  5906.5.3.1 Ducts. Where provided, connecting ducts or suction tubes shall be maintained as completely grounded, as short as possible, and without bends. Ducts shall be maintained with a smooth interior, with internal lap joints pointing in the direction of airflow and without unused capped side outlets, pockets or other dead-end spaces which allow an accumulation of dust.  5906.5.3.2 Independent dust separators. Each machine shall be maintained with an individual dust-separating unit in accordance with the applicable building code. Exceptions: 1. One separator is allowed to serve two dust-producing units on multi unit machines. 2. One separator is allowed to serve not more than four portable dust-producing units in a single enclosure or stand.  5906.5.4 Power supply interlock. Where provided, power supply to machines shall be maintained to be interlocked with exhaust airflow, and liquid pressure level or flow. The interlock shall be maintained to shut down the machine it serves when the dust removal or separator system is not operating properly.	5906.5 Use of magnesium. The use of magnesium shall comply with Sections 5906.5.1 through 5906.5.8 and only be conducted in buildings or structures approved for that use in accordance with the applicable building code.  5906.5.1 Melting pots. Floors under and around melting pots shall be of noncombustible construction.  5906.5.2 Heat-treating ovens. Approved means shall be provided for control of magnesium fires in heat-treating ovens.  5906.5.3 Dust collection. Where provided, magnesium grinding, buffing and wire-brushing operations, other than rough finishing of castings, shall be conducted with approved hoods or enclosures for dust collection in accordance with the applicable building code.  5906.5.3.1 Ducts. Where provided, connecting ducts or suction tubes shall be maintained as completely grounded, as short as possible, and without bends. Ducts shall be maintained with a smooth interior, with internal lap joints pointing in the direction of airflow and without unused capped side outlets, pockets or other dead-end spaces which allow an accumulation of dust.  5906.5.3.2 Independent dust separators. Each machine shall be maintained with an individual dust-separating unit in accordance with the applicable building code. Exceptions: 1. One separator is allowed to serve two dust-producing units on multi unit machines. 2. One separator is allowed to serve not more than four portable dust-producing units in a single enclosure or stand.  5906.5.4 Power supply interlock. Where provided, power supply to machines shall be maintained to be interlocked with exhaust airflow, and liquid pressure level or flow. The interlock shall be maintained to shut down the machine it serves when the dust removal or separator system is not operating properly.	Multiple sections describing the requirements when using magnesium. The applicable building code addresses these only in F1 and F2 use groups but the use of magnesium may be found incidental to other uses. The proposal restores maintenance and operations requirements and any construction language has been removed. For example, in 5906.5.1 the commentary states that this requirement should seem obvious for any operation that involves melting any quantity of any metal. It is particularly important with flammable metals, however, because of the possibility of fire from an overheated melting pot or an explosion caused by the addition of alloying metal to the molten magnesium that has not been thoroughly dried before being added to the pot. Any quantity of absorbed moisture on the added metal will turn instantly to steam and cause a violent eruption of molten metal from the pot.
1002	CA	5906.5.5 Electrical equipment. Electric wiring, fixtures and equipment in the immediate vicinity of and attached to dust-producing machines, including those used in connection with separator equipment, shall be maintained in accordance with Chapter 6, NFPA 70 and the applicable building code.	5906.5.5 Electrical equipment. Electric wiring, fixtures and equipment in the immediate vicinity of and attached to dust-producing machines, including those used in connection with separator equipment, shall be maintained in accordance with Chapter 6, NFPA 70 and the applicable building code.	Restores reference to NFPA 70 as well as Chapter 6 for the maintenance of electrical equipment. This requirement for classified electrical equipment is intended to reduce the likelihood that any fixed or portable electrical wiring and electrical equipment attached to or located or used near dust-producing and dust-collecting machines will become an ignition source.
1003	CA	5906.5.6 Grounding. Where required by the applicable building code, equipment shall be maintained securely grounded by permanent ground wires in accordance with NFPA 70.	5906.5.6 Grounding. Where required by the applicable building code, equipment shall be maintained securely grounded by permanent ground wires in accordance with NFPA 70.	Restores the technical language from the IFC and reference to NFPA 70. As with Section 5906.5.5, this requirement is intended to reduce the likelihood of a buildup of static electricity that could produce a spark that would be an ignition source for flammable solids dust. This requirement is similar to grounding requirements for electrical equipment in other dust-producing environments.
1004	CAAM	6003.1.4.1 Floors. In addition to the requirements set forth in Section 5004.12, where liquid-tight floors were required by the applicable building code, they shall be maintained.	6003.1.4.1 Floors. In addition to the requirements set forth in Section 5004.12, floors of storage areas shall be maintained liquid-tight in accordance with the applicable building code.	Restores the requirement for maintaining floors as liquid tight in accordance with the applicable building code. This requirement increases the likelihood that if a highly toxic or toxic liquid comes in contact with the floor of the storage area, it will not soak in and be difficult to remove. If concrete is not properly treated, spills could seep into the floor and give off vapors over time. The use of liquid-tight floors is one of the methods mentioned in Section 5004 for drainage control and secondary containment. The requirements of this section would apply in any case.
1005	CAAM	6003.1.4.2 Separation—highly toxic solids and liquids. In addition to the requirements set forth in Section 5003.9.8, unless approved in accordance with the applicable building code, highly toxic solids and liquids in storage shall be located in approved hazardous material storage cabinets or isolated from other hazardous material storage in accordance with the applicable building code.	6003.1.4.2 Separation—highly toxic solids and liquids. In addition to the requirements set forth in Section 5003.9.8, highly toxic solids and liquids in storage shall be located in approved hazardous material storage cabinets or isolated from other hazardous material storage in accordance with the applicable building code.	The reference to Section 5004.12 requires the floor to be noncombustible except for the surfacing; therefore, the method used to make the floor liquid tight does not need to be noncombustible. The same requirement is stated in Section 5004.2.1.
1006	CAAM	6004.2.2.6 Gas rooms. Gas rooms shall comply with Section 5003.8.4 and both of the following requirements: 1. The exhaust ventilation from gas rooms shall be directed to an exhaust system. 2. Approved automatic sprinkler systems in gas rooms shall be maintained in accordance with Chapter 9 and the applicable building code.	6004.2.2.6 Gas rooms. Gas rooms shall comply with Section 5003.8.4 and both of the following requirements: 1. The exhaust ventilation from gas rooms shall be directed to an exhaust system. 2. Gas rooms shall be maintained with an approved automatic sprinkler system in accordance with Chapter 9 and the applicable building code.	Operational requirements for locating highly toxic materials in proper storage areas. In order to reduce the possibility of releasing hazardous fumes and vapors due to a fire involving highly toxic liquids and solids, adequate separation from other hazardous materials is required. The intent of this section is to separate flammable, explosive or other highly reactive materials from all highly toxic solids and liquids.
1007	CAAM	6004.2.2.8 Emergency power. Emergency power shall be maintained in accordance with Chapter 12, NFPA 70 and the applicable building code.	6004.2.2.8 Emergency power. Emergency power shall be maintained in accordance with Chapter 12, NFPA 70 and the applicable building code.	Restores Item 2 with maintenance language, not construction.
1008	CAAM	6004.2.2.9 Automatic fire detection system—highly toxic compressed gases. Where provided in rooms or areas where highly toxic compressed gases are stored or used, an approved automatic fire detection system shall be maintained in accordance with Chapter 9 and the applicable building code.	6004.2.2.9 Automatic fire detection system—highly toxic compressed gases. Where provided, an approved automatic fire detection system shall be maintained in accordance with Chapter 9 and the applicable building code in rooms or areas where highly toxic compressed gases are stored or used.	Restores the reference to Chapter 6 and NFPA 70 for maintenance and operation of emergency power.
1009	CA	6101.1 Scope. Storage, handling and transportation of liquefied petroleum gas (LP-gas) and LP-gas equipment pertinent to systems for such uses shall comply with this chapter and NFPA 58. Properties of LP-gases shall be determined in accordance with Appendix B of NFPA 58.	6101.1 Scope. Storage, handling and transportation of liquefied petroleum gas (LP-gas) and LP-gas equipment pertinent to systems for such uses shall comply with this chapter and NFPA 58. Properties of LP-gases shall be determined in accordance with Appendix B of NFPA 58.	Restores maintenance language for fire detection systems where provided. The intent of these systems is that a fire in the area could lead to the release of the highly toxic gases. Fires can heat gases stored and cause expansion, leading to overpressures and releases; therefore, warning of a fire is critical to avoiding such releases. The alarm system needs to provide a local alarm at the building, but the detection is required only in the room or area where the highly toxic gas is stored.
1010	CA	6101.2 Permits. Permits shall be required as set forth in Section 107.2. Distributors shall not fill an LP-gas container for which a permit is required unless an operational permit has been issued for that location by the fire code official, except when the container is for temporary use on construction sites.	6101.2 Permits. Permits shall be required as set forth in Section 107.2. Distributors shall not fill an LP-gas container for which a permit is required unless an operational permit has been issued for that location by the fire code official, except when the container is for temporary use on construction sites.	NA
1011	CA	Delete Section 6101.3	Delete Section 6101.3	NA
1012	CA	SECTION 6103 USE OF EQUIPMENT (CHANGE TITLE)	SECTION 6103 USE OF EQUIPMENT (CHANGE TITLE)	NA
1013	CAAM	6103.1 General. The use of LP-gas equipment shall be in accordance with the International Fuel Gas Code and NFPA 58, except as otherwise provided in this chapter.	6103.1 General. Portable LP-gas equipment shall be installed in accordance with the International Fuel Gas Code and NFPA 58, except as otherwise provided in this chapter.	Limits the scope to installation of PORTABLE equipment, not installation of stationary or permanent equipment regulated by the building code.
1014	CAAM	6104.1 General. The storage and handling of LP-gas and the maintenance of related equipment shall comply with applicable building code.	6104.1 General. The storage and handling of Portable LP-gas and the installation and maintenance of related equipment shall comply with NFPA 58 and be subject to the approval of the fire code official, except as provided in this chapter.	Limits the scope to storage and handling of PORTABLE equipment, not stationary or permanent equipment regulated by the building code.
1015	CAAM	6109.11.2 Storage. Storage in buildings and rooms used for gas manufacturing, gas storage, gas air mixing and vaporization shall be approved in accordance with the applicable building code. These areas are to be maintained in accordance with the applicable building code and NFPA 58.	6109.11.2 Operations and Maintenance. Buildings and rooms used for the storage shall be reviewed by the building official regarding requirements for Group H occupancies in accordance with the applicable building code. These areas are to be maintained in accordance with the applicable building code, Chapter 10 of NFPA 58 and both of the following: 1. Required vents to the outside at both top and bottom, shall be maintained in an operable condition. 2. The entire area shall be classified for the purposes of ignition source control in accordance with Section 6.22 of NFPA 58.	Restores a review by the building official for high-hazard Group H occupancy requirements when storage is within buildings or rooms used for gas manufacturing, gas storage, gas-air mixing and vaporization, and compressors not associated with liquid transfer. This section restores maintenance language regarding NFPA 58 including ventilation and sources of ignition.

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1016	CA		6203.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of organic peroxides in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Sections 5001, 5003, 6201 and 6203.	Restores the proper direction for how to use this chapter. The provisions of this section complement the requirements of Chapter 50 in structures occupied for the storage, handling or use of organic peroxides. The regulations contained in Sections 6203.1.1 through 6203.1.1.4 assume that the quantity of organic peroxides in a given building is limited to the maximum allowable quantities (MAQs) per control area as established in Section 5003.1; thus, the building is not classified in Occupancy Group H. The general requirements of Sections 5001 and 5003 are fully applicable to the storage and use of organic peroxides, in addition to the provisions of this chapter.
1017	CA		6203.1.1 Special limitations for indoor storage and use by occupancy. The indoor storage and use of organic peroxides shall be maintained in accordance with Sections 6203.1.1.1 through 6203.1.1.4.	Restores editorial references. Because certain occupancies may need to have organic peroxides on hand, Sections 6203.1.1.1 through 6203.1.1.4 provide regulations specific to occupancy group classifications and that recognize the relative hazards of both the occupancy and the organic peroxide.
1018	CA		6203.1.1.1 Group A, E, I or U occupancies. Unless otherwise approved by the applicable building code, in Group A, E, I or U occupancies, any amount of unclassified detonable and Class I organic peroxides shall be stored in accordance with the following: 1. Unclassified detonable and Class I organic peroxides shall be stored in hazardous materials storage cabinets complying with Section 5003.8.7. 2. The hazardous materials storage cabinets shall not contain other storage.	Restores limitations for certain occupancies where organic peroxides should not be located. Because of their respective explosive or higher deflagration hazard characteristics, even the smallest quantity of UD or Class I organic peroxides present in Group A, E, I or U occupancies must be stored in an approved hazardous materials storage cabinet constructed and placarded in accordance with Section 5003.8.7 to reduce the exposure of the materials to hazards from the surrounding environment.  In accordance with Note g in Table 5003.1.1(1), storage of UD organic peroxide in any amount is allowed only in buildings equipped throughout with an approved automatic sprinkler system, in accordance with Section 903.3.1. Also, based on Note e in Table 5003.1.1(1), where an approved storage cabinet is used, the MAQ that can be kept in the occupancies can be doubled.  To reduce the likelihood of contamination of the organic peroxide materials or damage to their packaging, Item 2 prohibits the storage of other materials in the approved organic peroxide storage cabinet.  In accordance with Section 6201.1, storage of UD organic peroxides must also comply with the applicable provisions of Chapter 56 for explosives.
1019	CA		6203.1.1.3 Group B, F, M or S occupancies. Unless otherwise approved by the applicable building code, unclassified detonable and Class I organic peroxides shall not be stored or used in offices, or retail sales areas of Group B, F, M or S occupancies.	Because of their explosive or higher deflagration hazard characteristics, UD and Class I organic peroxide cannot be stored in occupancies in Group B, F, M or S. Storage would result in an increased danger to the occupants, as well as exposure of the peroxides to the higher relative fire loads typically encountered in these occupancies.
1020	CA		6203.1.1.4 Classrooms. Unless otherwise approved by the applicable building code, in classrooms in Group B, F, M or S occupancies, any amount of unclassified detonable and Class I organic peroxides shall be stored in accordance with the following: 1. Unclassified detonable and Class I organic peroxides shall be stored in hazardous materials storage cabinets complying with Section 5003.8.7. 2. The hazardous materials storage cabinets shall not contain other storage.	This section is intended to allow for the occasional use of limited amounts of organic peroxides in certain scientific, experimental or demonstration settings; however, this section does not allow storage of any quantity of these materials for any length of time. The fire code official may limit the amount of organic peroxides brought into a structure for these uses. The quantity actually needed for the experiment should determine the amount allowed into a structure.  Because of their explosive or higher deflagration hazard characteristics, even the smallest quantity of UD or Class I organic peroxides must be stored in an approved hazardous materials storage cabinet constructed and placarded in accordance with Section 5003.8.7 to reduce the exposure of the materials to hazards from the surrounding environment.  In accordance with Note g in Table 5003.1.1(1), storage of UD organic peroxide in any amount is allowed only in buildings equipped throughout with an approved automatic sprinkler system, in accordance with Section 903.3.1. Also, based on Note e in Table 5003.1.1(1), where an approved storage cabinet is used, the MAQ that could be kept in these occupancies can be doubled.  To reduce the likelihood of contaminating organic peroxide materials or damaging their packaging, Item 2 prohibits the storage of other materials in the approved organic peroxide storage cabinet.  Note that in accordance with Section 6201.1, storage of UD organic peroxides must also comply with the applicable provisions of Chapter 56 for explosives.
1021	CA		6203.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of organic peroxides in amounts exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Chapter 50, this chapter and comply with the applicable building code.	The provisions of this section complement the requirements of Chapter 50 in structures occupied for the storage, handling or use of organic peroxides. The regulations in this section assume that the quantity of organic peroxides in a given building is in excess of the MAQ as established in Section 5003.1 and, therefore, that the building is classified in Occupancy Group H. The requirements of Chapter 50 apply to the storage and use of organic peroxides in addition to the provisions of this chapter.
1022	CA		6204.1.1 Detached storage. Unless otherwise approved by the applicable building code, storage of organic peroxides shall be in detached buildings when required by Section 5003.8.2.	Detached structures designed and constructed for the sole purpose of organic peroxide storage provide the best protection for people and property from fire and explosions. Detached storage structures should be constructed of noncombustible materials to prevent them from becoming involved in an outside fire that may endanger their contents or a fire stemming from ignited contents in storage.
1023	CAAM	TABLE 6204.2.1 ORGANIC PEROXIDES—DISTANCE TO EXPOSURES FROM OUTDOOR STORAGE AREAS	TABLE 6204.1.2 ORGANIC PEROXIDES—DISTANCE TO EXPOSURES FROM DETACHED STORAGE BUILDINGS OR OUTDOOR STORAGE AREAS	Outdoor storage is not regulated by the Building Code - consider renaming this section to only address outdoor storage areas. The separation distances listed in this table are intended to reduce the effects of radiant heat exposure in the event of a fire in an adjacent storage structure.  These clearances are intended to reduce the hazard to nearby structures and people in the event of a fire or explosion in a detached storage structure used for the storage of organic peroxides.
1024	CA		6204.1.2 Distance from detached buildings to exposures. Detached storage buildings for Classes I, II, III, IV and V organic peroxides shall be located in accordance with the applicable building code and maintain separation distances from exposures in accordance with Table 6304.1.2. Detached buildings containing quantities of unclassified detonable organic peroxides in excess of those set forth in Table 5003.8.2 shall be located in accordance with the applicable building code and maintain separation distances from exposures in accordance with Table 5604.5.2(1).	
1025	CAAM		6204.1.3 Liquid-tight floor. Liquid-tight floors shall be maintained in accordance with the applicable building code.	In addition to the requirement of Section 5004.12 that floors be constructed of noncombustible materials, liquid-tight floors are required so as to prevent the passage of liquids to adjacent spaces.
1026	CA		6204.1.4 Electrical wiring and equipment. Electrical wiring and equipment in storage areas for Class I or II organic peroxides shall be maintained in accordance with Chapter 6 and remain as classified in accordance with the applicable building code.	Restores referenced Chapter 6. Because of the danger of ignition by arcs or sparks in the event of an accidental spill or leak, electrical equipment and devices in storage areas for organic peroxides must be classified for use in Class I, Division 2 hazardous locations as described in NFPA 70.
1027	CAAM		6204.1.5 Smoke detection. Smoke detection systems shall be maintained in accordance with Chapter 9.	Provides the proper reference to Chapter 9 for maintenance of smoke detection systems.
1028	CAAM		6204.1.6 Maximum quantities. Maximum allowable quantities per building in a mixed occupancy building or detached storage building shall not exceed the amounts set forth by the applicable building code.	This section references the maximum allowable indoor storage quantities of organic peroxide on a per-building basis, as opposed to a per-control area basis, and regulates both mixed occupancy buildings and detached organic peroxide storage buildings.
1029	CAAM		6204.1.10 Explosion control. Explosion control for indoor storage rooms, areas and buildings containing unclassified detonable and Class I organic peroxides shall be maintained in accordance with Chapter 9.	Because of the possibility of a deflagration or detonation in the event of ignition of Class I organic peroxides, explosion relief venting must be provided to protect the storage building or structure from collapse. Explosion venting must be maintained to the requirements in Chapter 9.
1030	CAAM		6204.1.11 Standby power. Standby power for storage areas of Class I and unclassified detonable organic peroxide shall be maintained in accordance with Section 1203.	Restores reference to Chapter 12. A standby power system complying with Chapter 12 is required to be maintained as a backup power supply for the systems listed in this section. These systems may also be connected to an approved emergency power system instead of a separate standby power system (see commentary, Section 1203).
1031	CAAM		6204.2.5 Separation. In addition to the requirements of Section 5003.9.8, outdoor storage areas for organic peroxides in amounts exceeding those specified in Table 5003.12 shall be located a minimum distance of 50 feet (15 240 mm) from other hazardous material storage.	Restores reference to Table 5003.8.2 for outdoor storage areas. The required minimum 50-foot (15 240 mm) separation distance from other hazardous materials storage is intended to reduce the hazard of dangerous chemical reactions with other incompatible materials in the event of a spill, fire or explosion.
1032	CA		6204.2.3 Maximum quantities. Maximum quantities of organic peroxides in outdoor storage shall be in accordance with Table 6204.1.2.	Outdoor storage of organic peroxides must comply with the requirements specified in Table 6204.1.2, which establishes the minimum separation distances required between the outdoor storage area and exposures, including other outdoor storage areas, and the MAQ of organic peroxides being stored.
1033	CA		6303.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of oxidizing materials in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Sections 5001, 5003, 6301 and 6303. Oxidizing gases shall also comply with Chapter 53.	Restores how this chapter is to be used. The provisions of this section complement the requirements of Chapter 50 in structures used for the storage, handling or use of oxidizing materials. Unless otherwise indicated in a particular section, the regulations contained in Sections 6303.1.1 through 6303.1.3 assume that the quantity of oxidizers in a given building is limited to the MAQs established in Section 5003.1; thus, the building is not classified in Occupancy Group H. The general requirements of Sections 5001 and 5003 are fully applicable to the storage and use of organic peroxides in addition to the provisions of this chapter. In the event that the oxidizer being stored is a gas, it will also be subject to Chapter 53.
1034	CA		6303.1.1 Special limitations for indoor storage and use by occupancy. The indoor storage and use of oxidizing materials shall be in accordance with Sections 6303.1.1.1 through 6303.1.1.3.	Because certain occupancies may need to have oxidizing materials on hand, Sections 6303.1.1.1 through 6303.1.1.3 provide regulations that are specific to occupancy group classifications and recognize the relative hazards of both the occupancy and the oxidizing material.
1035	CA		6303.1.1.1 Class 4 liquid and solid oxidizers. The storage and use of Class 4 liquid and solid oxidizers shall comply with Sections 6303.1.1.1 through 6303.1.1.4.	Because of their explosive or higher deflagration hazard characteristics, Class 4 liquid and solid oxidizers warrant special consideration and limitations when stored or used in certain occupancies, as indicated in Sections 6303.1.1.1 through 6303.1.1.4.

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1046	CA		6303.1.1.1 Group A, E, I or U occupancies. Unless otherwise approved by the applicable building code, in Group A, E, I or U occupancies, any amount of Class 4 liquid and solid oxidizers shall be stored in accordance with the following: 1. Class 4 liquid and solid oxidizers shall be stored in hazardous materials storage cabinets complying with Section 5003.8.7. 2. The hazardous materials storage cabinets shall not contain other storage.	Because of their explosive or higher deflagration hazard characteristics, even the smallest quantity of Class 4 liquid and solid oxidizers present in Group A, E, I or U occupancies must be stored in an approved hazardous materials storage cabinet, constructed and placarded in accordance with Section 5003.8.7, to reduce the exposure of the materials to hazards from the surrounding environment.  It should also be noted that Note g to Table 5003.1.1(1) limits storage of Class 4 liquid and solid oxidizers in any amount to buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 503.3.1.1. Also, based on Note e to Table 5003.1.1(1), if an approved storage cabinet is used, the MAQ that could be kept in occupancies equipped with sprinklers can be doubled.
1047	CA		6303.1.1.2 Class 3 liquid and solid oxidizers. Unless otherwise approved by the applicable building code, a maximum of 200 pounds (91 kg) of solid or 20 gallons (76 L) of liquid Class 3 oxidizer is allowed in Group I occupancies when such materials are necessary for maintenance purposes or operation of equipment. The oxidizers shall be stored in approved containers and in an approved manner.	The higher amounts of Class 3 liquid and solid oxidizers permitted by this section in storage and use are in recognition of their common use for building maintenance purposes or equipment operation. Proper storage practices and safeguards must still be observed.
1048	CAAM	6303.1.1.3 Oxidizing gases. Except for cylinders of nonliquefied compressed gases not exceeding a capacity of 250 cubic feet (7 m <sup>3</sup> ) or liquefied compressed gases not exceeding a capacity of 46 pounds (21 kg) each used for maintenance purposes, patient care or operation of equipment, oxidizing gases shall not be stored or used in Group A, E, I or R occupancies or in offices in Group B occupancies.  The aggregate quantities of gases used for maintenance purposes and operation of equipment shall not exceed the maximum allowable quantity per control area listed in the applicable building code.  Medical gas systems and medical gas supply cylinders shall also be in accordance with Section 5306.	6303.1.1.3 Oxidizing gases. Except for cylinders of nonliquefied compressed gases not exceeding a capacity of 250 cubic feet (7 m <sup>3</sup> ) or liquefied compressed gases not exceeding a capacity of 46 pounds (21 kg) each used for maintenance purposes, patient care or operation of equipment, oxidizing gases shall not be stored or used in Group A, E, I or R occupancies or in offices in Group B occupancies.  The aggregate quantities of gases used for maintenance purposes and operation of equipment shall not exceed the maximum allowable quantity per control area listed in Table 5003.1.1(1).  Medical gas systems and medical gas supply cylinders shall also be in accordance with Section 5306.	In Occupancy Groups A, E, I or R, or offices in Group B occupancies, up to the MAQ of oxidizing gases per control area established in Table 5003.1.1(1) are allowed for maintenance and critical functions, such as patient care and maintenance of equipment.  To limit the amount of gas that could be released in any given incident, no individual cylinder may exceed a capacity of 250 cubic feet (7 m <sup>3</sup> ) for nonliquefied compressed gases or 46 pounds (21 kg) for liquefied compressed gases. Consistent with Section 6301.1, the provisions of Chapter 53 are also applicable to oxidizer gases, in addition to the provisions of this section.  The quantity limitation to office spaces in Group B occupancies allows small laboratories, doctor or dental spaces, or other nonoffice uses classified as Group B to store and use quantities up to the MAQs of flammable or oxidizing gases.
1049	CAAM	6303.1.2 Emergency shutoff. Compressed gas systems conveying oxidizing gases with manual or automatic emergency shutoff valves in accordance with the applicable building code shall be maintained and be accessible to be activated at each point of use and at each source.	6303.1.2 Emergency shutoff. Compressed gas systems conveying oxidizing gases shall maintain approved manual or automatic emergency shutoff valves that can be activated at each point of use and at each source in accordance with the applicable building code.	In order to maintain control over the flow of oxidizer gases under emergency conditions, each supply source and point of use of oxidizer compressed gas must have an approved emergency shutoff valve. These valves must be excess flow control valves to regulate the rate of flow of hazardous materials in the piping system, fail-safe valves or other approved types that will operate automatically, or there must be a manual means of operation to give the fire department or other responsible persons the ability to stop the flow of hazardous materials in an emergency. The valves must be provided with ready access and comply with Section 5003.2.2.1. Also see the commentaries to the definitions of "Emergency shutoff valve," "Emergency shutoff valve, manual" and "Emergency shutoff valve, automatic" in Section 202.
1049	CA		6303.1.3 Ignition source control. Ignition sources in areas containing oxidizing gases shall be controlled in accordance with Section 5003.7	Given the fact that oxidizers enhance or accelerate the combustion process, ignition sources, such as smoking and open flames, must be strictly controlled in oxidizer storage or use areas in accordance with the provisions of Section 5003.7 to reduce the likelihood of a fire involving the stored material.
1041	CAAM	6303.2 Class 1 oxidizer storage configuration. The outdoor storage configuration of Class 1 liquid and solid oxidizers shall be as set forth in Table 6303.2, indoor storage shall be in accordance with the applicable building code.	6303.2 Class 1 oxidizer storage configuration. The storage configuration of Class 1 liquid and solid oxidizers shall be as set forth in table 6303.2	Restores reference to Table 6303.2
1042	CAAM	<b>TABLE 6303.2 OUTDOOR STORAGE OF CLASS 1 OXIDIZER LIQUIDS AND SOLIDS</b>	<b>TABLE 6303.2 STORAGE OF CLASS 1 OXIDIZER LIQUIDS AND SOLIDS</b>	Operational requirements for storage arrangements.
1043	CAAM	6304.1 Indoor storage. Indoor storage of oxidizing materials in amounts exceeding the maximum allowable quantity per control area indicated in the applicable building code shall be maintained in accordance with Sections 5001, 5003 and 5004, this chapter and comply with the applicable building code.	6304.1 Indoor storage. Indoor storage of oxidizing materials in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) shall be maintained in accordance with Sections 5001, 5003 and 5004, this chapter and comply with the applicable building code.	Restores reference as to how to use this section. This section regulates the indoor storage of oxidizing materials when quantities are in excess of the MAQ and classified in Occupancy Group H. The general and storage provisions of Chapter 50 are applicable in addition to the requirements of this section. Storage of oxidizing materials inside structures must comply with Sections 6304.1.1 through 6304.2.3 to prevent uncontrolled release or exposure to conditions that may result in a fire or explosion.
1044	CAAM	6304.1.1 Explosion control. Explosion control for indoor storage rooms, areas and buildings containing Class 4 liquid or solid oxidizers shall be maintained in accordance chapter 9.	6304.1.1 Explosion control. Explosion control for indoor storage rooms, areas and buildings containing Class 4 liquid or solid oxidizers shall be maintained in accordance chapter 9 and remain in accordance with the applicable building code.	Restored reference to Chapter 9 for maintenance of explosion control. Because of the possibility of a deflagration or detonation in the event of ignition of oxidizers, explosion relief venting meeting the requirements of Section 911 must be maintained to protect the storage building or structure from collapse.
1045	CAAM	6304.1.2 Automatic sprinkler system. The automatic sprinkler system for oxidizer storage shall be maintained in accordance with Chapter 9.	6304.1.2 Automatic sprinkler system. The automatic sprinkler system for oxidizer storage shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code.	Adds reference to Chapter 9.
1046	CAAM	6304.1.3 In addition to section 5004.12, liquidtight floors of storage areas for liquid and solid oxidizers shall be maintained.	6304.1.3 In addition to section 5004.12, floors of storage areas for liquid and solid oxidizers shall be maintained liquidtight in accordance with the applicable building code.	Restores technical term "liquid tight" to the body of the code. Floors and sills of rooms or areas used to contain hazardous material spills must be liquid tight to prevent the flow of liquids to adjoining areas (see commentary, Section 5004.2). The floor surface should be compatible with the oxidizer materials to be retained and must be noncombustible, as required by Section 5004.12.
1047	CAAM	6304.1.4 Smoke detection. Smoke detection systems shall be maintained in accordance with Chapter 9.	6304.1.4 Smoke detection. Smoke detection systems shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code.	Restores reference to Chapter 9 for maintenance of smoke detection systems.
1048	CAAM	6304.1.5 Storage conditions. The maximum quantity of oxidizers per building in storage buildings shall not exceed those quantities set forth in the applicable building code. The storage configuration for liquid and solid oxidizers shall be as set forth in the applicable building code. Class 2 oxidizers shall not be stored in basements unless approved by the applicable building code. Class 3 and 4 oxidizers in amounts exceeding the maximum allowable quantity per control area set forth in 5003.1, shall be stored on the ground floor only unless otherwise approved by the applicable building code.	6304.1.5 Storage conditions. The maximum quantity of oxidizers per building in storage buildings shall not exceed those quantities set forth in tables 6304.1.5(1) through 6304.1.5(3). The storage configuration for liquid and solid oxidizers shall be as set forth in table 6303.2, and Tables 6304.1.5(1) through 6304.1.5(3). Class 2 oxidizers shall not be stored in basements unless approved by the applicable building code. Class 3 and 4 oxidizers in amounts exceeding the maximum allowable quantity per control area set forth in 5003.1, shall be stored on the ground floor only unless otherwise approved by the applicable building code.	Restores references to tables as well as technical details. This section covers storage requirements related to the hazards of oxidizers stored in storage structures. MAQs of oxidizers and their arrangement in the building must comply with Tables 6304.1.5(1) through (3).
1049	CAAM	TABLE 6304.2 (1) OUTDOOR STORAGE OF CLASS 2 OXIDIZER LIQUIDS AND SOLIDS	TABLE 6304.1.5(1) STORAGE OF CLASS 2 OXIDIZER LIQUIDS AND SOLIDS	Restores the table for reference.
1050	CAAM	TABLE 6304.2 (2) OUTDOOR STORAGE OF CLASS 3 OXIDIZER LIQUIDS AND SOLIDS	TABLE 6304.1.5(2) STORAGE OF CLASS 3 OXIDIZER LIQUIDS AND SOLIDS	Restores the table for reference.
1051	CAAM	TABLE 6304.2 (3) OUTDOOR STORAGE OF CLASS 4 OXIDIZER LIQUIDS AND SOLIDS	TABLE 6304.1.5(3) STORAGE OF CLASS 4 OXIDIZER LIQUIDS AND SOLIDS	Restores the table for reference.
1053	CA		6304.2.2 Storage configuration for liquid and solid oxidizers. Storage configuration for liquid and solid oxidizers shall be maintained in accordance with table 6303.2 and Tables 6304.1.5(1) through 6304.1.5(3) and comply with the applicable building code.	Restores reference to how this section is to be used. The outside storage arrangements for liquid and solid oxidizers are the same as for inside storage arrangements contained in Section 6304.1.8 and its referenced tables (see commentary, Section 6304.1.8).
1054	CA		6305.1 Scope. The use of oxidizers in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) or 5003.1.1(3) shall be maintained in accordance with Sections 5001, 5003, 5005, this chapter and comply with the applicable building code. Oxidizing gases shall also comply with Chapter 53.	Restores reference to how this section is to be used. This section applies to all indoor and outdoor dispensing, use and handling of oxidizers when these amounts are in excess of the MAQ per indoor or outdoor control area indicated in Table 5003.1.1(1) or 5003.1.1(3), respectively. The administrative, general use, handling and dispensing provisions of Chapter 50 are applicable in addition to the requirements of this chapter.
1055	CAAM	6306.4 Maximum aggregate quantity. The maximum aggregate quantity of liquid oxygen allowed in storage and in use in each dwelling unit shall be 31.6 gallons (120 L). Exceptions: 1. The maximum aggregate quantity of liquid oxygen allowed in Group I-4 occupancies shall be limited by the maximum allowable quantity set forth in the applicable building code. 2. Where individual sleeping rooms are separated from the remainder of the dwelling unit by fire-resistant rated assemblies constructed in accordance with the applicable building code, the maximum aggregate quantity per dwelling unit shall be increased to allow a maximum of 31.6 gallons (120 L) of liquid oxygen per sleeping room.	6306.4 Maximum aggregate quantity. The maximum aggregate quantity of liquid oxygen allowed in storage and in use in each dwelling unit shall be 31.6 gallons (120 L). Exceptions: 1. The maximum aggregate quantity of liquid oxygen allowed in Group I-4 occupancies shall be limited by the maximum allowable quantity set forth in Table 5003.1.1(1). 2. Where individual sleeping rooms are separated from the remainder of the dwelling unit by fire-resistant rated assemblies constructed in accordance with the applicable building code, the maximum aggregate quantity per dwelling unit shall be increased to allow a maximum of 31.6 gallons (120 L) of liquid oxygen per sleeping room.	The VRC does not regulate MAQ. This section establishes a maximum aggregate amount of 31.6 gallons (120 L) inside of each dwelling unit. This allows for one container to be in use and an additional cylinder in storage.
1056	CA		6403.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of pyrophoric materials in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Sections 5001, 5003, 6401, and 6403.	Restores direction as to how the chapter is to be used. The provisions of this section complement the requirements of Chapter 50 for structures occupied for the storage, handling or use of pyrophoric materials. The general requirements of Sections 5001 and 5003, in addition to the provisions of this chapter, are fully applicable to the storage and use of organic peroxides.
1057	CAAM	6403.1.1 Emergency shutoff. Manual or automatic emergency shutoff valves for compressed gas systems conveying pyrophoric gases shall be maintained and be accessible to be activated at each point of use and at each source in accordance with the applicable building code.	6403.1.1 Emergency shutoff. Manual or automatic emergency shutoff valves at each point of use and at each source for compressed gas systems conveying pyrophoric gases shall be maintained.	Restores where emergency shutoff are to be provided. This section requires that an automatic emergency shutoff valve be provided on pyrophoric compressed gas systems activated by a remotely located, manually activated control. A minimum distance of 15 feet (4572 mm) has been specified to provide reasonable separation distance between the control and the source as a means to protect persons using the control from radiant heat in a fire event. When the source of supply is limited to unmanifoldd cylinders, the cylinder valve is allowed to be either manual or automatic.
1058	CA		6403.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Chapter 50, this chapter, and comply with the applicable building code.	Provides guidance for how to use this chapter for quantities exceeding the MAQ. This section complements the requirements of Chapter 50 for structures used for the storage, handling or use of pyrophoric materials. The regulations contained in this section assume that the quantity of pyrophoric materials in a given building is in excess of the maximum allowable quantities per control area (MAQ) as established in Section 5003.1, thus classifying the building as a Group H occupancy. The requirements of Chapter 50 apply to the storage and use of pyrophoric materials, in addition to the provisions of this chapter.

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		6404.1 Indoor storage. Indoor storage of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in the applicable building code, shall be in accordance with Sections 5001, 5003 and 5004, this chapter and comply with the applicable building code. The storage of silane gas, and gas mixtures with a silane concentration of 1.37 percent or more by volume, shall be maintained in accordance with CGA G-13.	6404.1 Indoor storage. Indoor storage of pyrophoric materials in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1), shall be in accordance with Sections 5001, 5003 and 5004, this chapter and comply with the applicable building code. The storage of silane gas, and gas mixtures with a silane concentration of 1.37 percent or more by volume, shall be maintained in accordance with CGA G-13.	Restores direction as to how the chapter is to be used. Also restores critical reference to CGA G-13 for silane gas. This section regulates the indoor storage of pyrophoric materials where they exceed the MAQ in buildings or portions of buildings classified as Group H occupancies. The general and storage provisions of Chapter 50 are applicable in addition to the requirements of this section. Storage of pyrophoric materials inside of structures must comply with Sections 6404.1.1 through 6404.1.4 to prevent uncontrolled release or exposure to conditions that may result in a fire or explosion. Section 6405.3 covers silane gas use. See the commentary introduction to this chapter for a detailed discussion of silane.
1059	CAAM	6404.1.1 Liquid-tight floor. In addition to the requirements of Section 5004.12, liquid-tight floors shall be maintained in accordance with the applicable building code.	6404.1.1 Liquid-tight floor. In addition to the requirements of Section 5004.12, floors of storage areas containing pyrophoric liquids shall be maintained liquid-tight in accordance with the applicable building code.	Restores the term "liquid tight" in the body of the code. Floors and sills of rooms or areas used to contain hazardous material spills must be liquid tight to prevent the flow of liquids to adjoining areas (see commentary, Section 5004.2). The floor surface should be compatible with the pyrophoric materials to be retained and must be noncombustible, as required by Section 5004.12.
1060	CAAM			
1061	CA	6404.1.2 Pyrophoric solids and liquids. Unless otherwise approved by the applicable building code, storage of pyrophoric solids and liquids shall be limited to the following: A maximum area of 100 square feet (9.3 m <sup>2</sup> ) per pile. Storage shall not exceed 5 feet (1524 mm) in height. Individual containers shall not be stacked.  Aisles between storage piles shall be a minimum of 10 feet (3048 mm) in width.  Individual tanks or containers shall not exceed 500 gallons (1893 L) in capacity.	6404.1.2 Pyrophoric solids and liquids. Unless otherwise approved by the applicable building code, storage of pyrophoric solids and liquids shall be limited to the following: A maximum area of 100 square feet (9.3 m <sup>2</sup> ) per pile. Storage shall not exceed 5 feet (1524 mm) in height. Individual containers shall not be stacked.  Aisles between storage piles shall be a minimum of 10 feet (3048 mm) in width.  Individual tanks or containers shall not exceed 500 gallons (1893 L) in capacity.	Inside storage restrictions, including pile height, container arrangement and aisle width, are intended to reduce the potential involvement of multiple piles, reduce the exposure hazard to occupants and facilitate fire department access to the storage areas. Inside storage of pyrophoric liquids in tanks or containers is limited to an individual capacity of 500 gallons (1893 L) to reduce the exposure hazard in the event of a single container failure. Prohibiting the stacking of individual containers reduces the likelihood of container failure from stacking stresses. Wide aisles reduce the fire exposure hazard between piles and, in the event of a fire-related collapse of a pile, reduce the likelihood of a "domino" effect that could not only increase fire intensity but also completely block access to pile areas by fire suppression personnel. While not specifically mentioned in this section, inside storage must also be protected as required by Chapter 50, which includes provisions for incompatible material storage, security, signage, control of ignition sources and submittal of a storage plan.
1062	CAAM	6404.1.3 Pyrophoric gases. Storage of pyrophoric gases shall be in detached buildings when required by the applicable building code.	6404.1.3 Pyrophoric gases. Storage of pyrophoric gases shall be maintained in detached buildings in accordance with Section 5003.8.2 and comply with the applicable building code.	This section is an important cross reference to Section 5003.8.2 and Table 5003.8.2. The table requires that storage of more than 2,000 cubic feet (57 m <sup>3</sup> ) of pyrophoric gas must be in a detached building complying with Section 5004.14.  Detached structures designed and constructed for the sole purpose of pyrophoric material storage provide the best protection for people and property from fire and explosion.
1063	CAAM	6404.1.4 Separation from incompatible materials. In addition to the requirements of Section 5003.9.8, indoor storage of pyrophoric materials shall be isolated from incompatible hazardous materials in accordance with the applicable building code. Fire-resistance rated construction and openings shall be maintained in accordance with Chapter 7. Exception: Storage in approved hazardous materials storage cabinets constructed in accordance with Section 5003.8.7.	6404.1.4 Separation from incompatible materials. In addition to the requirements of Section 5003.9.8, indoor storage of pyrophoric materials shall be isolated from incompatible hazardous materials by fire-resistance rated construction with openings protected in accordance with the applicable building code. Exception: Storage in approved hazardous materials storage cabinets constructed in accordance with Section 5003.8.7.	Restores a critical operational requirement. This section is intended to separate all incompatible, flammable, explosive or other highly reactive materials from the inside storage areas of pyrophoric materials. A 1-hour fire barrier assembly or, as allowed by the exception, an approved hazardous materials storage cabinet can reduce the potential involvement of pyrophoric materials in a fire involving other incompatible hazardous materials. Note that the provisions of Section 6404.1.4 are to be applied in addition to the requirements of Section 5003.9.8.
1064	CAAM	6404.2.2 Weather protection. Automatic fire-extinguishing systems for overhead sheltering of outdoor storage areas of pyrophoric materials shall be maintained in accordance with Chapter 9.	6404.2.2 Weather protection. When overhead sheltering of outdoor storage areas of pyrophoric materials is provided, the storage areas shall be maintained with approved automatic fire-extinguishing system protection in accordance with Chapter 9.	Adds reference to Chapter 9 for sprinkler systems. The general requirements for construction of weather protection roofs over outdoor storage areas are contained in Section 5004.13 of the code; however, due to the hazards of pyrophoric materials, this section is a specific provision applicable to pyrophoric materials that requires roofed-over outdoor storage areas to be sprinklered.
1065	CAAM	6405.2 Weather protection. Automatic fire-extinguishing system for overhead sheltering of outdoor use areas of pyrophoric materials shall be maintained in accordance with Chapter 9.	6405.2 Weather protection. When overhead sheltering of outdoor use areas of pyrophoric materials is provided, the storage areas shall be maintained with approved automatic fire-extinguishing system protection in accordance with Chapter 9.	Add reference to Chapter 9 for sprinkler systems. The general requirements for the construction of weather protection roofs over outdoor use areas are contained in Section 5005.3.9 of the code; however, due to the hazards of pyrophoric materials, this section is a specific provision applicable to pyrophoric materials that requires roofed-over outdoor use areas to be sprinklered.
1066	CA			
1067	CA	6504.1 Raw material. Raw cellulose nitrate (pyroxylin) plastic material in a Group F building shall be stored and handled in accordance with Sections 6504.1.1 through 6504.1.7.	6504.1 Raw material. Raw cellulose nitrate (pyroxylin) plastic material in a Group F building shall be stored and handled in accordance with Sections 6504.1.1 through 6504.1.7.	Corrects section references. Raw pyroxylin (cellulose nitrate) plastic materials present increased hazards when they are involved in manufacturing processes. To reduce those increased hazards, the provisions of Sections 6504.1.1 through 6504.1.7 are applicable to buildings used for the fabrication of items containing pyroxylin (cellulose nitrate) plastic.
1068	CA	6504.1.1 Storage of incoming material. Unless otherwise approved by the applicable building code, where raw material in excess of 25 pounds (11 kg) is received in a building or fire area, it shall be stored in an approved vented cabinet or approved vented vault equipped with an approved automatic sprinkler system in accordance with the applicable building code.	6504.1.1 Storage of incoming material. Unless otherwise approved by the applicable building code, where raw material in excess of 25 pounds (11 kg) is received in a building or fire area, it shall be stored in an approved vented cabinet or approved vented vault equipped with an approved automatic sprinkler system in accordance with the applicable building code.	Provides important guidance for proper storage of excess material. The amount of heat liberated by pyroxylin (cellulose nitrate) plastics when burning and the speed with which it burns make conventional extinguishment virtually impossible. This, coupled with the poisonous combustion gases, produce conditions that require material confinement and rapid fire suppression.
1069	CAAM	6504.1.2 Fire protection. Unless otherwise permitted by the applicable building code, buildings or portions thereof used for the manufacture or storage of articles of cellulose nitrate (pyroxylin) plastic in quantities exceeding 100 pounds (45 kg) shall maintain an approved automatic sprinkler system in accordance with the applicable NFPA 13 standard and the applicable building code.	6504.1.2 Fire protection. Unless otherwise permitted by the applicable building code, buildings or portions thereof used for the manufacture or storage of articles of cellulose nitrate (pyroxylin) plastic in quantities exceeding 100 pounds (45 kg) shall maintain an approved automatic sprinkler system in accordance with NFPA 13 and the applicable building code.	Restores reference to NFPA 13 for the type of fire protection system. Because pyroxylin (cellulose nitrate) plastics pose unusual and substantial fire risks, burn at a rate 15 times greater than comparable common combustibles and, when burning, release highly flammable and toxic combustion byproducts, fire involving these materials are very difficult to control.
1070	CA	6603.1 Quantities not exceeding the maximum allowable quantity per control area. Quantities of unstable (reactive) materials not exceeding the maximum allowable quantity per control area shall be in accordance with Sections 6603.1.1 through 6603.1.2.5.	6603.1 Quantities not exceeding the maximum allowable quantity per control area. Quantities of unstable (reactive) materials not exceeding the maximum allowable quantity per control area shall be in accordance with Sections 6603.1.1 through 6603.1.2.5.	Provides guidance for how to use the chapter. The regulations contained in Sections 6603.1.1 through 6603.1.2.5 assume that the quantity of unstable (reactive) materials in a given building is limited to the MAQs as established in Section 5003.1; thus, the building is not classified in Occupancy Group H.
1071	CA	6603.1.1 General. The storage and use of unstable (reactive) materials in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be in accordance with Sections 5001, 5003, 6601 and 6603.	6603.1.1 General. The storage and use of unstable (reactive) materials in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be in accordance with Sections 5001, 5003, 6601 and 6603.	This section complements the requirements of Chapter 50 in structures occupied for the storage, handling or use of unstable (reactive) materials. Unless otherwise indicated in a particular section, the regulations contained in Sections 6603.1.2 through 6603.1.2.5 assume that the quantity of unstable (reactive) materials in a given building is limited to the MAQs as established in Section 5003.1. The general requirements of Sections 5001 and 5003 are fully applicable to the storage and use of unstable (reactive) materials, in addition to the provisions of this chapter.
1072	CA	6603.1.2 Limitations for indoor storage and use by occupancy. The indoor storage of unstable (reactive) materials shall be maintained in accordance with Occupancies 6603.1.2.1 through 6603.1.2.5 and comply with the applicable building code.	6603.1.2 Limitations for indoor storage and use by occupancy. The indoor storage of unstable (reactive) materials shall be maintained in accordance with Occupancies 6603.1.2.1 through 6603.1.2.5 and comply with the applicable building code.	Restores editorial language for operational use/storage. Because unstable (reactive) materials may be needed in certain occupancies, Sections 6603.1.2.1 through 6603.1.2.5 provide regulations that are specific to occupancy group classifications and that recognize the relative hazards of both the occupancy and the unstable (reactive) materials.
1073	CA	6603.1.2.1 Group A, E, I or U occupancies. Unless otherwise approved by the applicable building code, in Group A, E, I or U occupancies, any amount of Class 3 and 4 unstable (reactive) materials shall be stored in accordance with the following: 1. Class 3 and 4 unstable (reactive) materials shall be stored in hazardous material storage cabinets complying with Section 5003.8.7. 2. The hazardous material storage cabinets shall not contain other storage.	6603.1.2.1 Group A, E, I or U occupancies. Unless otherwise approved by the applicable building code, in Group A, E, I or U occupancies, any amount of Class 3 and 4 unstable (reactive) materials shall be stored in accordance with the following: 1. Class 3 and 4 unstable (reactive) materials shall be stored in hazardous material storage cabinets complying with Section 5003.8.7. 2. The hazardous material storage cabinets shall not contain other storage.	Restores specific guidelines for locations of unstable (reactive) materials. Because of their explosive or higher deflagration hazard characteristics, even the smallest quantity of Class 3 and 4 unstable (reactive) materials present in Group A, E, I or U occupancies must be stored in an approved hazardous material storage cabinet constructed and placarded in accordance with Section 5003.8.7 to reduce the exposure of the materials to hazards from the surrounding environment.  In accordance with Table 5003.1.1(1), Note g, storage of Class 4 unstable (reactive) materials in any amount is allowed only in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Also, based on Table 5003.1.1(1), Note e, where an approved storage cabinet is used, the MAQ of unstable (reactive) materials that could be kept in those occupancies can be doubled.  To reduce the likelihood of contamination of the organic peroxide materials or damage to their packaging, Item 2 prohibits the storage of other materials in the approved unstable (reactive) materials storage cabinet.
1074	CA	6604.1 Indoor storage. Indoor storage of unstable (reactive) materials in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and comply with the applicable building code. In addition, Class 3 and 4 unstable (reactive) detonable materials shall be stored in accordance with the applicable building code requirements for explosives.	6604.1 Indoor storage. Indoor storage of unstable (reactive) materials in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1(1) shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and comply with the applicable building code. In addition, Class 3 and 4 unstable (reactive) detonable materials shall be stored in accordance with the applicable building code requirements for explosives.	This section regulates the indoor storage of unstable (reactive) materials when in excess of the MAQ in buildings or portions of buildings classified in Occupancy Group H. The general and storage provisions of Chapter 50 are applicable in addition to the requirements of this section. Storage of unstable (reactive) materials inside structures must comply with Sections 6604.1.1 through 6604.1.5 to prevent uncontrolled release or exposure to conditions that may result in a fire or explosion.  Because of the explosion hazard, Class 3 and 4 detonable unstable (reactive) materials must be stored as required by this section, Chapter 56 and applicable building code requirements for explosives.
1075	CAAM	6604.1.1 Detached storage. Storage of unstable (reactive) materials shall be maintained in detached buildings when required by the applicable building code.	6604.1.1 Detached storage. Storage of unstable (reactive) materials shall be maintained in detached buildings when required in Section 5003.8.2.	Restores reference to Table 5003.8.2. Detached structures designed and constructed for the sole purpose of unstable (reactive) materials storage are the best protection for people and property from fire and explosion. Detached storage structures should be constructed of noncombustible materials to prevent them from becoming involved in either an outside fire that may endanger their contents or an indoor fire due to the structure's contents igniting.
1076	CAAM	6604.1.2 Explosion control. Explosion control for indoor storage rooms, areas and buildings containing Class 3 or 4 unstable (reactive) materials shall be maintained in accordance with Chapter 9.	6604.1.2 Explosion control. Indoor storage rooms, areas and buildings containing Class 3 or 4 unstable (reactive) materials shall be maintained with explosion control in accordance with Chapter 9 and the applicable building code.	Restores the reference to Chapter 9 for explosion control maintenance as well as technical details that would be removed. Because of the possibility of a deflagration or detonation in the event of ignition of Class 3 or 4 unstable (reactive) materials, explosion relief venting must be installed to protect the storage building or structure from collapse. Explosion venting must conform to the requirements of Section 911.

	C	E	F	G
1077	CA		6703.1 Quantities not exceeding the maximum allowable quantity per control area. The storage and use of water-reactive solids and liquids in amounts not exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Sections 5001, 5003, 6701 and 6703.	Restores editorial references and guidance as to how this chapter is to be applied. This section complements the requirements of Chapter 50 in structures occupied for the storage, handling or use of water-reactive materials limited to the MAQs as established in Section 5003.1. The general requirements of Sections 5001 and 5003 are fully applicable to the storage and use of water-reactive materials, as are the requirements of this chapter.
1078	CA		6703.2 Quantities exceeding the maximum allowable quantity per control area. The storage and use of water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in Section 5003.1 shall be maintained in accordance with Chapter 50, this chapter and comply with the applicable building code.	Restores editorial references and guidance as to how this chapter is to be applied. This section complements the requirements of Chapter 50 in structures occupied for the storage, handling or use of water-reactive materials. The regulations contained in this section assume that the quantity of water-reactive materials in a given building is in excess of the MAQs as established in Section 5003.1; thus, the building is classified in Occupancy Group H. The requirements of Chapter 50 apply to the storage and use of water-reactive material, as do the requirements of this chapter.
1079	CAAM	6704.1 Indoor storage. Indoor storage of water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and comply with the applicable building code.	6704.1 Indoor storage. Indoor storage of water-reactive solids and liquids in amounts exceeding the maximum allowable quantity per control area indicated in Table 5003.1.1.(1), shall be maintained in accordance with Sections 5001, 5003, 5004, this chapter and comply with the applicable building code.	Restores editorial language describing how to use the chapter. This section regulates the indoor storage of water-reactive materials when in excess of the MAQ in buildings or portions of buildings classified in Occupancy Group H. The general and storage requirements of Chapter 50 are applicable in addition to the requirements of this section. Storage of water-reactive materials inside structures must comply with Sections 6701.1 through 6704.1.7 to prevent uncontrolled release or exposure to conditions that may result in a fire or explosion.
1080	CAAM	6704.1.1 Detached storage. The storage of water-reactive solids and liquids shall be in detached buildings where required by the applicable building code.	6704.1.1 Detached storage. The storage of water-reactive solids and liquids shall be maintained in detached buildings as set forth by Section 5003.8.2 and remain in accordance with the applicable building code.	Restores clarification that water-reactive materials are to be stored in approved detached buildings. Detached structures designed and constructed for the sole purpose of water reactive materials storage maximize protection for people and property from fire and explosion. Detached storage structures should be constructed of noncombustible materials to prevent them from becoming involved in either an outside fire that may endanger their contents or an indoor fire due to the structure's contents igniting.  Section 5003.8.2 and Table 5003.8.2 require detached storage when the indoor storage quantities are more than 1 ton (908 kg) of Class 3 water reactive solid or liquid materials or more than 25 tons (22 700 kg) of Class 2 water reactive solid or liquid material. See the commentaries to Section 5003.8.2 and Table 5003.8.2 for further discussion of detached storage requirements.
1081	CAAM	6704.1.2 Liquid-tight floor. In addition to the provisions of Section 5004.12, liquid-tight floors in storage areas for water-reactive solids and liquids shall be maintained in accordance with the applicable building code.	6704.1.2 Liquid-tight floor. In addition to the provisions of Section 5004.12, floors in storage areas for water-reactive solids and liquids shall be maintained liquid-tight in accordance with the applicable building code.	Restored the term "liquid tight" to the body of the code. Floors and sills of rooms or areas used to contain hazardous material spills must be liquid tight to prevent the flow of liquids to adjoining areas (see commentary, Section 5004.2). The floor surface should be compatible with the water-reactive materials to be retained and must be noncombustible, as required by Section 5004.12.
1082	CA		6704.1.3 Waterproof room. Rooms or areas used for the storage of water-reactive solids and liquids shall be maintained in a manner which resists the penetration of water in accordance with the applicable building code.	Restores the critical requirement to maintain a waterproof room where required. The design and construction of rooms used for storing water-reactive materials must prevent water from coming into contact with the stored materials. The building materials should be noncombustible so they do not contribute fuel to a fire or reaction and should be designed to resist the passage of flowing water.  A major safeguard is planning the design of the room and locating it to minimize water hazards. For example, in a two-story building it would not be appropriate to put a water-reactive materials storage room directly below a locker room with showers or a bathroom located on the second floor.  Similarly, the enclosure walls of a storage room should not contain plumbing piping. Though water piping may not be run into or through storage rooms, the code recognizes that automatic sprinkler systems are a more regulated type of water piping system and have a low leakage and failure rate when properly installed and maintained.
1083	CA		6704.1.5 Storage configuration. Water-reactive solids and liquids stored in quantities greater than 500 cubic feet (14 m <sup>3</sup> ) shall be maintained separated into piles, each not larger than 500 cubic feet (14 m <sup>3</sup> ) unless otherwise approved by the applicable building code. Aisle widths between piles shall not be less than the height of the pile or 4 feet (1219 mm), whichever is greater. Exception: Water-reactive solids and liquids stored in tanks. Class 2 water-reactive solids and liquids shall not be stored in basements unless such materials are stored in closed water-tight containers or tanks. Class 3 water-reactive solids and liquids shall not be stored in basements. Class 2 or 3 water-reactive solids and liquids shall not be stored with flammable liquids.	Restores technical details and requirements for proper operational storage. This section details storage requirements of water-reactive materials stored in structures. It is intended to reduce the amount of material exposed in a single incident, and the attendant hazards of release or ignition, by managing pile sizes and their separation. Water-reactive materials are limited to piles no larger than 500 cubic feet (14 m <sup>3</sup> ) in volume [approximately 8 feet by 8 feet by 8 feet high (2438 mm by 2438 mm by 2438 mm)]. Aisle widths that are equal to the pile height or 4 feet (1219 mm), whichever is greater, reduce the fire exposure hazard between piles and, in the event of a fire-related collapse of a pile, reduce the likelihood of a "domino" effect that could not only increase fire intensity but also completely block access to pile areas by fire suppression personnel. Although not specifically mentioned in this section, inside storage must also comply with Chapter 50, which includes provisions for incompatible material storage, security, signage, control of ignition sources and submittal of a storage plan.
1084	CAAM	6704.1.6 Explosion control. Explosion control for indoor storage rooms, areas and buildings containing Class 2 or 3 water-reactive solids and liquids shall be maintained in accordance with Chapter 9.	6704.1.6 Explosion control. Indoor storage rooms, areas and buildings containing Class 2 or 3 water-reactive solids and liquids shall be maintained with explosion control in accordance with Chapter 9 and comply with the applicable building code.	Restores technical details as well as reference to Chapter 9 for explosion control maintenance. The violently reactive nature of Class 2 and 3 water-reactive materials can seriously damage or destroy a storage room or structure. To prevent damage or destruction in storage rooms or structures where Class 2 or 3 water-reactive materials are stored, an explosion control system must be maintained as required in Section 911.
1085	CAAM	6704.2.5 Containment. Secondary containment shall be maintained in accordance with the provisions of Section 5004.2.2.	6704.2.5 Containment. Secondary containment shall be maintained in accordance with the provisions of Section 5004.2.2 and remain in accordance with the applicable building code.	Restores reference to 5004.2.2. To prevent the flow of water-reactive liquids to adjoining rooms or spaces, secondary containment complying with Section 5004.2.2 is required to be maintained by this section.  Note that secondary containment requirements do not provide for control of the flammable, irritating or toxic vapors given off by reacted materials, and care must be taken to minimize exposure to hazardous vapors.  Runoff from spills or manual fire suppression activities may result in environmental contamination if not properly controlled (see commentary, Section 5004.2).

## FP103.2.1 (VFSB SFPC Edit Part 4)-18

**Proponents:** Andrew Milliken (amilliken@staffordcountyva.gov); SFPC Edit Workgroup

**Reason Statement:** This proposal includes items that were reviewed and decided on by the SFPC Edit Workgroup at their 7/30/20 and 8/20/20 SWG meetings, as well as items that were reviewed and decided on at the 9/1/20 Workgroup 2 (Combined WG) meeting. Proposal initially approved by Workgroup 2 on 8/11/20 (items from the 7/30 Fire Code Edit WG meeting).

Proposal Reapproved by Workgroup 2 on 9/1/20 (items from 8/20 Fire Code Edit WG meeting were added)

9/1 Workgroup 2 approval included all items that were reviewed and decided on at the 9/1/20 Workgroup 2 (Combined WG) meeting

**Resiliency Impact Statement:** This proposal will increase Resiliency  
This group of proposals will increase resiliency.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
This proposal is not related to construction.

**See attached for specific proposals**

	C	E	F	G
	WG REC	WG AMENDMENTS/MODIFICATIONS	VFSB PROPOSAL	VFSB REASON/COMMENTS
1			101.2.1 Provisions of this code shall not require modifications or installation of construction elements or systems required or regulated by the applicable building code. This shall be understood to not require installation if no system, appliance, device, etc. was previously installed under the applicable building code.	New subsection to make it very clear that these regulations do not require construction
2	CA	101.2.2 Where this code requires maintenance or a system, structure, appliance, etc. to be maintained it shall not be construed to be a requirement for installation through this code.	101.2.2 Where this code requires maintenance or a system, structure, appliance, etc. to be maintained it shall not be construed to be a requirement for installation through this code. If the Fire Official identifies what is believed to be an oversight or violation of the applicable building code the issue shall be brought to the attention of the Building Official in the locality who shall take appropriate action under the provisions of the USBC for remediation.	New subsection to make it clear how the Fire Official should handle situations where they find a construction issue
3	CAAM		107.2 Add the following operational permit: Plant extraction systems. An operational permit is required to use plant extraction systems.	Adds the required operational permit for the plant extraction systems regulated in New Chapter 39. This section establishes an operational permit for operations that use solvents for the processing and extraction of fats and oils from plants.
4	CA			
5	CA		110.1 General. The fire official shall order the following dangerous or hazardous conditions or materials found to be non-compliant with provisions found within the subsequent sections of this code to be removed or remedied in accordance with the SFPPC. 110.4 Unsafe structures. All structures that are or shall hereafter become unsafe or deficient in adequate exit facilities or which constitute a fire hazard, or are otherwise dangerous to human life or the public welfare, or by reason of illegal or improper use, occupancy or maintenance or which have sustained structural damage by reason of fire, explosion, or natural disaster shall be deemed unsafe structures. A vacant structure, or portion of a structure, unguarded or open at door or window shall be deemed a fire hazard and unsafe within the meaning of this code. Unsafe structures in violation of the applicable building code shall be reported to the building official or building maintenance official who shall take appropriate action under the provisions of the USBC to secure abatement. Subsequently, the fire official may request the legal counsel of the local governing body to institute the appropriate proceedings for an injunction against the continued use and occupancy of the structure until such time as conditions have been remedied.	Add language "found to be non-compliant with provisions found within subsequent sections of this code" to make it clear that other code sections should be cited to identify an unsafe structure. Add language "in violation of the applicable building code" for additional clarification.
6	CA		202 MOBILE FOOD PREPARATION VEHICLES. Vehicles, covered trailers, carts, and enclosed trailers, or other moveable devices capable of being able to be occupied by persons during cooking operations and that contain cooking equipment that utilize open flames or are capable of producing smoke or grease laden vapors for the purpose of preparing and serving food to the public. Vehicles used for private recreation shall not be considered mobile food preparation vehicles.	Adds terms covered trailers, carts or other moveable devices
8	CA		202 OUTDOOR FIREPLACE. A portable or permanent, outdoor, solid-fuel-burning fireplace that may be constructed of steel, concrete, clay or other noncombustible material. An outdoor fireplace may be open in design, with a spark arrester, or may be equipped with a small hearth opening and a short chimney or chimney opening in the top with a combustion chamber of not more than 36 inches in diameter by 24 inches in height size.	Removes the word portable from the phrase and becomes inclusive of portable and non-portable outdoor fireplaces (not regulated by the building code).
9	CA		301.2 Permits. Permits shall be required as set forth in Section 107.2 for the activities or uses regulated by Sections 306, 307, 308, 315 and 319.	Adds section 319 to the list of sections requiring a permit
10	CA		304.1.3 Space underneath seats. Spaces underneath grandstand and bleacher seats shall be kept free from combustible and flammable materials. Exception: Where enclosed by fire-resistance-rated construction or otherwise approved in accordance with the applicable building code.	Regulates the storage and materials located under a grandstand or bleacher. Consistent with other similar sections. Numerous fires in grandstands and stadiums have shown over the years that the accumulation of flammable or combustible materials under grandstand seating areas can lead to fire disasters. One of the best ways to prevent a fire is to make certain there is no fuel to feed one.  The since the I-codes the IBC does allow space under the stands to be used for purposes other than means of egress if that space is separated from the seating area by construction having at least a 1-hour fire-resistance rating. The separation is intended to allow time for occupants in the seating to vacate if a fire should occur. The building code official would usually have to approve plans for use of space under the stands for concession stands, sales areas or storage areas.
12	CA		304.3.2 Capacity exceeding 5.88 cubic feet. Containers with a capacity exceeding 5.88 cubic feet (44 gallons) (0.17 m <sup>3</sup> ) shall be provided with lids. Containers and lids shall be constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m <sup>2</sup> where tested in accordance with ASTM E1354 at an incident heat flux of 50 kW/m <sup>2</sup> in the horizontal orientation. Exception: Wastebaskets complying with Section 806.	Restores the language and exception deleted in the 2015 SFPPC.
13	CA		304.3.3 Capacity exceeding 1.5 cubic yards. Dumpsters and containers with an individual capacity of 1.5 cubic yards (40.5 cubic feet (1.15 m <sup>3</sup> )) or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines. Exception: 1. Dumpsters or containers in areas protected by an approved automatic sprinkler system installed throughout in accordance with applicable building code NFPA 13 standard. 2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings and used exclusively for dumpster or container storage. 3. Dumpsters or containers that are located adjacent to buildings where the exterior area is protected by an approved automatic sprinkler system.	Adds exception 3 which is new for the 2018 IFC
14	CAAM	304.3.4 Capacity of 1.0 cubic yard or more. Dumpsters with an individual capacity of 1.0 cubic yard 200 gallons (0.76 m <sup>3</sup> ) or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the dumpsters are constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m <sup>2</sup> where tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m <sup>2</sup> in the horizontal orientation. Exception: 1. Dumpsters in areas protected by an approved automatic sprinkler system installed throughout in accordance with the applicable building code NFPA 13 standard. 2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings, and used exclusively for dumpster or container storage.	304.3.4 Capacity of 1.0 cubic yard or more. Dumpsters with an individual capacity of 1.0 cubic yard 200 gallons (0.76 m <sup>3</sup> ) or more shall not be stored in buildings or placed within 5 feet (1524 mm) of combustible walls, openings or combustible roof eave lines unless the dumpsters are constructed of noncombustible materials or of combustible materials with a peak rate of heat release not exceeding 300 kW/m <sup>2</sup> where tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m <sup>2</sup> in the horizontal orientation. Exception: 1. Dumpsters in areas protected by an approved automatic sprinkler system installed throughout in accordance with the applicable building code NFPA 13 standard. 2. Storage in a structure shall not be prohibited where the structure is of Type I or IIA construction, located not less than 10 feet (3048 mm) from other buildings, and used exclusively for dumpster or container storage.	Changes "applicable building code" to "applicable building code NFPA 13 Standard"
15	CAAM		308.1.6 Open-flame devices. Torches and other devices, machines or processes liable to start or cause fire shall not be operated or used in or upon wildfire risk areas, except by a permit in accordance with Section 107.2 secured from the fire code official.	Corrects reference to 107.2
16	CA		311.6 Unoccupied tenant spaces in mall buildings: Unoccupied tenant spaces in covered and open mall buildings shall be: 1. Kept free from the storage of any materials. 2. Where provided, fire rated separations from the adjoining tenant spaces shall be maintained in accordance with Chapter 7. 3. Without doors or other access openings other than one door that shall be kept key locked in the closed position except during that time when opened for inspection. 4. Kept free from combustible waste and be broom swept clean.	Restores language to maintain any existing fire rated separations.
17	CAAM	315.4 Outside storage. Outside storage of combustible materials shall not be located within 10 feet (3048 mm) of a lot line. Exception: 1. The separation distance is allowed to be reduced to 3 feet (914 mm) for storage not exceeding 6 feet (1829 mm) in height. 2. The separation distance is allowed to be reduced when the fire official determines that hazard to the adjoining property does not exist.	315.4 Outside storage. ***Delete and keep the IFC language	Deletes VA amendment and follow identical IFC language
18	CA		319.5.1 Fire protection for cooking equipment. Cooking equipment shall be protected by automatic fire extinguishing systems in accordance with Section 904.2.	Correlate with 904.2 and 904.3 to figure out what reference should be changed
20	CA		503.1.1 Buildings and facilities. Approved fire apparatus access roads shall be provided for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45,720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility. Exception: 1. The fire code official is authorized to increase the dimension of 150 feet (45,720 mm) where any of the following conditions occur: 1.1. The building is equipped throughout with an approved automatic sprinkler system in accordance with the applicable NFPA 13, NFPA 13R, or NFPA 13D standard. 1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades, or other similar conditions, and an approved alternative means of fire protection is provided. 1.3. There are not more than two Group R-3, R-5 or Group U occupancies. 2. Where approved by the fire code official, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.	Revises exceptions to note the "applicable NFPA 13, NFPA 13R or NFPA 13D standard rather than a reference to Chapter 9.
22	CA		503.7 Fire lanes for existing buildings. The fire code official is authorized to designate public and private fire lanes as deemed necessary for the efficient and effective operation of fire apparatus. Fire lanes shall comply with Sections 503.2 through 503.7	Restores the scope to include through section 503.7 which is a VA amendment.
23	CA		601.1 Scope. The provisions of this chapter shall apply to the operation and maintenance of fuel-fired appliances and heating systems, electrical systems and equipment, mechanical refrigeration systems, elevator recall and commercial kitchen equipment.	The base document language needs to be updated to reflect the new topic list for the 2018 IFC
24	CA		601.2 Permits. Permits shall be obtained for refrigeration systems as set forth in Section 107.2.	The base document language needs to be updated to reflect the new topic list for the 2018 IFC
25	CA		603.1.1 Manufacturer's instructions. Appliances shall be installed, operated and maintained in accordance with the manufacturer's instructions and applicable federal, state, and local rules and regulations. Where it becomes necessary to change, modify, or alter a manufacturer's instructions in any way, written approval shall first be obtained from the manufacturer.	Restores the term installed since this section regulates the installation of items not subject to the applicable building code.
26	CA		603.1.3 Electrical wiring and equipment. Electrical wiring and equipment used in connection with oil-burning equipment shall be maintained in accordance with Section 604 and the applicable NFPA 70 standard.	Corrects reference to 604 based on changes in the 2018 IFC
27	CAAM			

	C	E	F	G
28	CA		603.3 Fuel oil storage systems. Fuel oil storage systems shall be maintained in accordance with this Section and the applicable building code.	Revises wording for consistency
29	CA		603.3.1 Fuel oil storage in outside, aboveground tanks. Where connected to a fuel-oil piping system, the maximum amount of fuel oil storage allowed outside above ground without additional protection shall be 660 gallons (2498 L) unless otherwise installed in accordance with the applicable building code. The storage of fuel oil above ground in quantities exceeding 660 gallons (2498 L) shall be maintained in accordance with NFPA 31.	Changes "comply be maintained" to "be maintained"
30	CA		603.3.2 Fuel oil storage inside buildings. Fuel oil storage inside buildings shall be maintained in accordance with this section and the applicable building code.	Revises wording for consistency
31	CA		603.3.2.1 Quantity limits. One or more fuel oil storage tanks containing Class II or III combustible liquid shall be permitted to be stored in a building. Unless otherwise approved by the applicable building code, the aggregate capacity of all tanks shall not exceed the following:  660 gallons (2498 L) in unsprinklered buildings, where stored in a tank complying with UL 80, UL 142 or UL 2085, 1,320 gallons (4996 L) in buildings equipped with an automatic sprinkler system in accordance with the applicable NFPA 13 standard, where stored in a tank complying with UL 142. 3,000 gallons (11,356 L) where stored in protected above-ground tanks complying with UL 2085 and Section 5704.2.9.7 and the room is protected by an automatic sprinkler system in accordance with the applicable NFPA 13 standard.	Restores reference to increased quantities of fuel oil that may be stored in a building. This section correlates with Table 307.1(1). Note of the VCC. This section highlights flexibility to allow more combustible fuel in buildings beyond that allowed by MAQs for other code applications. These amounts are essentially exceptions to the maximum allowance quantities of 120 gallons for Class II liquids and 530 Gallons for Class IIIA liquids in VCC Table 307.1(1). In order to apply this section, such fuel supplies are required to be connected to a closed fuel oil piping system. This would apply to most oil-fired stationary equipment in industrial, commercial and residential occupancies. Note that this provision applies only to the aggregate storage of fuel oil and does not include the capacity of the piping system.
32	CA		603.3.2.2 Restricted use and connection. Tanks subject to Section 603.3.2 shall be used only to supply fuel oil to fuel-burning equipment, generators or fire pumps installed in accordance with the applicable building code. Connections between tanks and equipment supplied by such tanks shall be maintained as closed piping systems.	Restores limited use of fuel oil for specific equipment. This is use and operation, not construction. This section makes it clear that the fuel oil storage inside of buildings is only applicable only to fuel oil supplies for oil-burning equipment, generators and fire pumps and are not intended to be connected to a fuel oil piping system supplying such equipment. Fuel oil piping systems are regulated by Chapter 13 of the VMC.
33	CA		603.3.2.4 Installation. New or modified tanks and piping systems shall be approved by the Building Official in accordance with the applicable building code.	Clarifies that a building permit is required for new or modified piping.
34	CAAM	603.3.2.6 Spill control. Where provided or required in accordance with the applicable building code, spill control shall be maintained in accordance with Section 5703.4 and the applicable building code.	603.3.2.6 Spill containment. Unless otherwise approved in accordance with the applicable building code, tanks exceeding 55-gallon (208 L) capacity or an aggregate capacity of 1,000 gallons (3785 L) that are not provided with integral secondary containment shall maintain permanent or portable spill containment sized to contain a release from the largest tank.	Spill containment is operational and can be accomplished without construction. This section specifies that spill containment is required where a single tank exceeds 55 gallons, or the aggregate exceeds 1,000 gallons. These thresholds are identical to the thresholds in Section 5004.2.1 for spill containment of liquids.  The secondary containment is sized to contain the largest spill. Even for tanks located inside a sprinklered building, only the tank contents must be contained. This is consistent with the requirements found in Section 6.3.5.3 of NFPA 37. This section provides a more direct path to comply with NFPA 37.
35	CAAM	603.3.3 Underground storage of fuel oil. Underground storage tanks used for the storage of fuel oil shall be maintained and operated in accordance with the applicable building code and the applicable NFPA 31 standard.	603.3.3 Underground storage of fuel oil. The storage of fuel oil in underground storage tanks shall be maintained in accordance with the applicable building code and NFPA 31.	Restores reference to NFPA 31. Section 603.3 does not require that fuel oil tanks be installed underground. The code user is directed to NFPA 31 for specific requirements applicable to underground combustible liquid storage tanks.
36	CA		603.5 Heating appliances. Heating appliances shall be listed and shall comply with Sections 603.5.1 and 603.5.2.	Restores requirement for space heating appliances to be listed. This is not construction language.
37	CAAM	603.5.2 Heating appliance maintenance. Heating appliances shall be maintained in accordance with the manufacturer's instructions, the applicable building code and the applicable NFPA 70 standard.	603.5.2 Heating appliance installation and maintenance. Heating appliances shall be maintained in accordance with the manufacturer's instructions, the applicable building code and NFPA 70.	Restores reference to manufacturer's instructions and NFPA 70.
38	CA		603.6 Chimneys and appliances. Chimneys, incinerators, smokestacks or similar devices for conveying smoke or hot gases to the outer air and the stoves, furnaces, fireboxes or boilers to which such devices are connected shall be maintained according to manufacturer's instructions, comply with the applicable building code, and be maintained so as to not create a fire hazard.	Restores prohibition of obvious fire hazards. A primary function of the code is to reduce or eliminate fire hazards through proper maintenance of appliances and systems that are potential fire and life safety hazards.
39	CA		603.6.2 Metal chimneys. Metal chimneys or supports that are damaged or corroded shall be repaired or replaced.	Restores the word supports.
40	CA		603.6.4 Factory-built chimneys. Existing factory-built chimneys or their supports that are damaged or corroded shall be repaired or replaced.	Restores the word supports.
41	CA		603.6.5 Connectors. Existing chimney and vent connectors or their supports that are damaged or corroded shall be repaired or replaced.	Restores the word supports.
42	CA		603.8 Incinerators. Commercial, industrial and residential-type incinerators and chimneys shall be installed in accordance with the applicable building code and maintained.	Revised sentence structure for consistency.
43	CA	604.10.1 Listed and labeled. Only listed and labeled portable, electric space heaters shall be used.	604.10.1 Listed and labeled. ***Delete amendment	No need for VA amendment.
44	CA	605.1.2 Ammonia refrigeration. Refrigeration systems using ammonia refrigerant and the buildings in which such systems are installed shall comply with the applicable operating procedures of IAR-7. Decommissioning of ammonia refrigeration systems shall comply with IAR-8 and the applicable building code.	605.1.2 Ammonia refrigeration. Refrigeration systems using ammonia refrigerant and the buildings in which such systems are installed shall comply with IAR-7 for operating procedures. Decommissioning of ammonia refrigeration systems shall comply with IAR-8 and the applicable building code.	Restores language about decommissioning. This section is specific to ammonia, whereas Section 605.1.1 deals with all other refrigerant types. The references in this section provide standards for ammonia refrigeration system operating procedures and decommissioning. These standards are considered essential for facilities with ammonia refrigeration systems as a basis of providing for the safety of these facilities, as well as surrounding communities.
45	CAAM		605.4 Change in refrigerant type. A change in the type of refrigerant in a refrigeration system shall be approved by the Building Official in accordance with the applicable building code.	Ensures that changes in the type of refrigerant will comply with the requirements of the building code. This section is intended to keep the code requirements up-to-date on the status of large refrigeration systems and systems containing toxic and/or flammable refrigerants.
46	CA		605.6 Testing of equipment. Refrigeration equipment and systems having a refrigerant circuit containing more than 220 pounds (100 kg) of Group A1 or 30 pounds (14 kg) of any other group refrigerant shall be subject to periodic testing in accordance with Section 605.6.1. Records of tests shall be maintained. Tests of emergency devices or systems required by the applicable building code shall be conducted by persons trained and qualified in refrigeration systems.	Corrects reference to 605
47	CA	605.8.1 Refrigerants other than ammonia. Refrigerant detection systems required by the applicable building code shall be maintained. Detectors and alarms required by the applicable building code shall be maintained in approved locations.  Unless otherwise permitted by the applicable building code, detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room.	605.8.1 Refrigerants other than ammonia. Refrigerant detection systems shall be maintained. Detectors and alarms shall be maintained in approved locations. The alarm shall be actuated where the concentration of refrigerant detected exceeds the lesser of the following: The corresponding TLV-TWA values shown in the applicable building code for the refrigerant classification. Twenty-five percent of the lower flammable limit (LFL).  Unless otherwise permitted by the applicable building code, detection of a refrigerant concentration exceeding the upper detection limit or 25 percent of the lower flammable limit (LFL), whichever is lower, shall stop refrigerant equipment in the machinery room.	Restores model code language and important shut downs. Refrigerant detectors provide early warning of refrigerant leakage. Such leakage could result in a significant fire or health hazard if not discovered and stopped or if occupants are not evacuated from the building. Machinery rooms are required by the IMC where refrigerant quantities exceed specified limits.  Detector location is critical to early leakage warning and should comply with the detector manufacturer's instructions. Because machinery rooms are unattended most of the time, once the refrigerant gas is detected at the levels noted in this section (the lesser of the TLV-TWA values in the IMC or 25 percent of the LFL), an alarm must be initiated. The alarm is intended to alert those both inside the area of detection and in the immediate vicinity to prevent harm to those outside the area of refrigerant gas release. Where required, the notification to an approved location provides timely information to those who must take a role in emergency response, whereas the local alarm is a warning for those in the vicinity of the release. As a first step in the mitigation of the hazards of fugitive refrigerant gas, the required detectors have the additional important role of activating the emergency ventilation-exhaust systems in the machinery rooms required by the applicable building code. This section also requires that the system be shut down in accordance with Section 605.9.1.
48	CAAM	605.9 Remote controls. Remote controls of the mechanical equipment and appliances located in the machinery room shall be maintained and remain accessible in accordance with the applicable building code at all times.	605.9 Remote controls. Remote controls of the mechanical equipment and appliances located in the machinery room shall be maintained in accordance with the applicable building code and accessible at all times.	Restores model code language context about what the remote controls are connected to. Emergency controls located outside of the machinery room enclosure will allow shutdown of the compressors and related equipment without requiring someone to enter the room and risk being exposed to refrigerant or fire. This arrangement would also permit equipment shutdown by fire-fighting personnel without the risk of fire spreading into or out of the fire-resistance-rated enclosure. The controls are usually located near the entrance to the machinery room so that their location is conspicuous. The controls are typically labeled and color coded so that their purpose is obvious. Such controls are customarily painted red to make them readily identifiable as emergency devices.
49	CAAM	605.9.1 Refrigeration system emergency shutoff. Where a clearly identified switch of an approved type is required by the applicable building code to provide off-only control of refrigerant compressors, refrigerant pumps and normally closed automatic refrigerant valves located in the machinery room, the switch shall be maintained as approved. Unless otherwise permitted by the applicable building code, this equipment shall be maintained to automatically shut off when the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LEL, whichever is lower.	605.9.1 Refrigeration system emergency shutoff. Where required by the applicable building code, a clearly identified switch of an approved type shall be maintained to provide off-only control of refrigerant compressors, refrigerant pumps and normally closed automatic refrigerant valves located in the machinery room. Where additionally required by the applicable building code, this equipment shall be maintained to automatically shut off when the refrigerant vapor concentration in the machinery room exceeds the vapor detector's upper detection limit or 25 percent of the LEL, whichever is lower.	Restores technical language without mandating construction or installation. This section of the code is intended to maintain a safe environment for emergency response personnel when responding to an incident in a refrigeration room. Shutting down compressors and related refrigeration equipment could be necessary to prevent a hazardous condition from worsening and to allow the room to be safely entered. The emergency "kill" switch are usually lamp-resistant type (similar to manual fire alarm boxes) that requires more than one action to actuate it. To prevent an accidental startup, the switch is capable of only stopping the controlled machinery, not restarting it. The switch must not affect the operation of life safety systems, such as detectors and exhaust equipment, and must not affect room and egress lighting. In addition to the manual switch, the required refrigerant room detector must also be maintained to shut down the same equipment when the vapor concentration exceeds the lesser of the detector's upper detection limit or 25 percent of the refrigerant's lower explosive limit (LEL).
50	CAAM	605.10 Emergency pressure control system. Emergency pressure control system provided for permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant or ammonia shall be maintained as installed in accordance with the applicable building code and this code.	605.10 Emergency pressure control system. Permanently installed refrigeration systems containing more than 6.6 pounds (3 kg) of flammable, toxic or highly toxic refrigerant or ammonia shall maintain an emergency pressure control system in accordance with the applicable building code and this section.	Restores model code language context. The automatic controls required by Sections 605.10.1 through 605.10.2.2 provide a means of mitigating an overpressure condition prior to operation of emergency pressure-relief vents and, most likely, prior to the arrival of emergency responders. The automatic valves also eliminate the need for emergency responders to decipher the condition of a system in an attempt to determine whether operation of manual crossover valves in an emergency control box would be of benefit in mitigating a system malfunction. The 6.6-pound (3 kg) threshold parallels existing provisions in Section 605.11.
51	CAAM			Overall, these provisions add a requirement for a fully redundant safety control system in lieu of a manual system that has proven itself to be rarely, if ever, utilized by the fire service. This favorably resolves long-standing concerns regarding the potential for harm caused by an untrained person operating valves in an emergency control box. There is no condition where removal of refrigerant from a refrigeration system by the fire service is considered advisable. In contrast, automatic transfer of excess pressure to another zone of the system in conjunction with stopping the pressure source (i.e., the compressors) can safely mitigate an overpressure condition.

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44	GAAM	605.10.1.2 Manual operation. Where provided or required in accordance with the applicable building code, manual operation of the automatic crossover valve shall be maintained.	605.10.1.2 Manual operation. Where required by the applicable building code, automatic crossover valves shall be maintained capable of manual operation.	Operational requirements not construction. Although this provision is not regarded as necessary by the industry, it is recognized that some fire departments will prefer to have the manual control capability for backup. Corrects reference to 605
45	CA		605.12 Discharge and termination of pressure relief and purge systems. Pressure relief devices, fusible plugs and purge systems discharging to the atmosphere from refrigeration systems containing flammable, toxic or highly toxic refrigerants or ammonia shall be maintained in accordance with Sections 605.12.2 through 605.12.4.	Corrects references to 605
46	CA		605.12.2 Flammable refrigerants. Unless otherwise regulated by the applicable building code, systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density equal to or greater than the density of air shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section 605.12.5 or a flaring system in accordance with Section 605.12.6. Systems containing more than 6.6 pounds (3 kg) of flammable refrigerants having a density less than the density of air shall be permitted to discharge vapor to the atmosphere provided that the point of discharge is located outside of the structure at not less than 15 feet (4572 mm) above the adjoining grade level and not less than 20 feet (6096 mm) from any window, ventilation opening, or exit.	Corrects references to 605
47	CAAM	605.12.3 Toxic and highly toxic refrigerants. Systems containing more than 6.6 pounds (3 kg) of toxic or highly toxic refrigerants that discharge vapor to the atmosphere shall discharge through a treatment system, flaring system, or other approved system in accordance with the applicable building code.	605.12.3 Toxic and highly toxic refrigerants. Unless otherwise approved in accordance with the applicable building code, systems containing more than 6.6 pounds (3 kg) of toxic or highly toxic refrigerants shall discharge vapor to the atmosphere only through an approved treatment system in accordance with Section 605.12.5 or a flaring system in accordance with Section 605.12.6.	Restores reference to the approved discharge methods. Toxic refrigerants, like flammable refrigerants, must be treated to reduce their toxicity or be destroyed by incineration
48	CAAM	605.12.4 Ammonia refrigerant. Systems containing more than 6.6 pounds (3 kg) of ammonia refrigerants that discharge vapor to the atmosphere shall discharge through a treatment system, flaring system, ammonia diffusion system, or other approved system in accordance with the applicable building code. Exception: Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.	605.12.4 Ammonia refrigerant. Unless otherwise approved in accordance with the applicable building code, systems containing more than 6.6 pounds (3 kg) of ammonia refrigerant shall discharge vapor to the atmosphere in accordance with one of the following methods: 1. Directly to atmosphere where the fire code official determines, on review of an engineering analysis prepared in accordance with Section 104.7.2, that a fire, health or environmental hazard would not result from atmospheric discharge of ammonia. 2. Through an approved treatment system in accordance with Section 605.12.5. 3. Through a flaring system in accordance with Section 605.12.6. 4. Through an approved ammonia diffusion system in accordance with Section 605.12.7. 5. By other approved means. Exception: Ammonia/water absorption systems containing less than 22 pounds (10 kg) of ammonia and for which the ammonia circuit is located entirely outdoors.	Restores technical and operational language for discharge methods. This section requires the discharge operation to be treated in one of the listed methods. Item 1 recognizes that there are some cases, such as at remote facilities, where atmospheric discharge of ammonia would pose no danger to people or property. Further, it provides a basis in the code for permitting relief lines on ammonia refrigeration systems to discharge to the atmosphere where an appropriate analysis, accepted by the fire code official, has shown that such discharge can be accomplished safely. In such cases, a flaring or water diffusion system would serve no beneficial purpose, since ammonia is naturally biodegradable. Items 2 through 4 allow the use of one of three methods, including treatment systems, flaring system or an ammonia diffusion system.  Item 5 recognizes that other approved means such as engineered designs may have been approved to activate an alarm and automatically stop the leak rather than relying on manual means to stop the leak and a water tank to treat whatever release may occur before manual intervention can be accomplished.  The exception recognizes the reduced hazard in smaller systems where the ammonia circuit is completely outdoors.
49	CA		605.12.5 Treatment systems. Unless otherwise approved by the applicable building code, treatment systems shall be maintained and operated to reduce the allowable discharge concentration of the refrigerant gas to not more than 50 percent of the IDLH at the point of exhaust. Treatment systems shall be operated and maintained in accordance with Chapter 60 and the applicable building code.	Restores technical and operational language for treatment systems.
50	CAAM	605.12.6 Flaring systems. Flaring systems for incineration of flammable refrigerants shall be operated and maintained to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Where required by the applicable building code, standby fuel, such as LP-gas, and standby power shall be maintained to have the capacity to operate for the required time for complete incineration of refrigerant in the system and any additional capacity required by the applicable building code. Standby electrical power, where required to complete the incineration process, shall be maintained in accordance with Section 1203.	605.12.6 Flaring systems. Flaring systems for incineration of flammable refrigerants shall be operated and maintained to incinerate the entire discharge. The products of refrigerant incineration shall not pose health or environmental hazards. Unless otherwise approved in accordance with the applicable building code, incineration shall be automatic upon initiation of discharge, shall be maintained to prevent blowback and shall not expose structures or materials to threat of fire. Where required by the applicable building code, standby fuel, such as LP-gas, and standby power shall be maintained to have the capacity to operate for one and one-half the required time for complete incineration of refrigerant in the system. Standby electrical power, where required to complete the incineration process, shall be maintained in accordance with Section 1203.	Restores technical language for flaring operations. Destruction of refrigerant by incineration is supposed to render the discharge harmless, so obviously the flames and the combustion byproducts do not pose a hazard themselves. Because most refrigerants would not support combustion unaided, a fuel source is necessary to sustain incineration.
51	CAAM	605.13 Mechanical ventilation exhaust. Treatment systems required by the applicable building code for exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants, other than ammonia, capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be operated and maintained. Exception: Refrigeration systems containing Group A2L complying with Section 605.17.	605.13 Mechanical ventilation exhaust. Exhaust from mechanical ventilation systems serving refrigeration machinery rooms containing flammable, toxic or highly toxic refrigerants, other than ammonia, capable of exceeding 25 percent of the LFL or 50 percent of the IDLH shall be operated and maintained with approved treatment systems to reduce the discharge concentrations to those values or lower. Exception: Refrigeration systems containing Group A2L complying with Section 605.17.	Restores technical language to ensure the operational requirements. This section permits the mechanical ventilation system to exhaust directly to the atmosphere when anhydrous ammonia is the refrigerant. Anhydrous ammonia is classified as a corrosive liquefied compressed gas. It is not a toxic or highly toxic gas, as defined in Section 202 of the code, nor does it meet the definition of a flammable gas. It has a vapor density of 0.597, making it lighter than air, and is extremely hygroscopic (a Latin word literally meaning "water seeking"), thus it aggressively absorbs water. Anhydrous ammonia's water-absorbing abilities can be of benefit to fire fighters, who can use hose or master streams to control anhydrous ammonia if it is leaking.  The exception to this section recognizes the reduced risk of the lower flammability rating of A2L refrigerants when they comply with Section 605.17. Essentially, Section 605.17 includes detection and ventilation, which removes the need to provide a treatment system as the flammability concentration is much lower.
52	CAAM	605.16 Electrical equipment. The hazardous location classification, as determined in accordance with the applicable building code and the applicable NFPA 70 standard, of refrigeration machinery rooms where refrigerants of Groups A2, A3, B2 and B3 are used, shall be maintained.	605.16 Electrical equipment. Where refrigerant of Groups A2, A3, B2 and B3 are used, refrigeration machinery rooms shall conform to the hazardous location classification requirements of NFPA 70 and the applicable building code. Exceptions: 1. Ammonia machinery rooms that have approved ventilation in accordance with the applicable building code. 2. Machinery rooms for systems containing Group A2L refrigerants that maintain ventilation in accordance with Section 605.17 and the applicable building code.	Restores the purpose of this section. A reference to classified electrical requirements here is consistent with the approach taken in Chapters 50 and 57 for other hazardous materials and flammable liquids, and it provides the fire code official with the provisions that are to be enforced. The first exception for ammonia refrigerant is consistent with requirements of NFPA 70 and is included here to avoid possible confusion regarding the need for classified electrical equipment in ammonia machinery rooms. Because ammonia can combust within a limited range of concentrations in the air, the fire code official might be led to believe that classified electrical equipment should be provided in ammonia storage and use areas; however, when such areas are ventilated to maintain ammonia vapor at a concentration that is outside of the flammable range, there is no need for classified electrical equipment. The second exception recognizes the lower hazard associated with A2L refrigerants and does not require electrical classification where ventilation in accordance with 605.17.2 is provided. Note that the hazards associated with A2L are similar to that of ammonia. The ventilation rates in Table 605.17.2 are founded in published research.
53	CA	605.17 Special requirements for Group A2L refrigerant machinery rooms. Machinery rooms with systems containing Group A2L refrigerants shall comply with Sections 605.17.1 through 605.17.3. Exception: Machinery rooms conforming to the Class 1, Division 2 hazardous location classification requirements of NFPA 70.	605.17 Special requirements for Group A2L refrigerant machinery rooms. ***Delete amendment	Scoping language only, no VA amendment needed.
54	CAAM	605.17.2 Emergency ventilation system operation. An emergency ventilation system shall be maintained to operate at the minimum exhaust rate specified in accordance with the applicable building code. Means to manually shut down the system shall be maintained.	605.17.2 Emergency ventilation system operation. An emergency ventilation system shall be maintained at the minimum exhaust rate specified in accordance with the applicable building code. Where provided, shut down of the emergency ventilation system shall remain by only a manual means.	Operational language, not construction. This section ensure the specific ventilation rates are maintained through compliance with the applicable building code (ASHRAE 15). The ventilation shutdown is also addressed and required to be manual.
55	CAAM	605.17.3 Emergency ventilation system discharge. Where required by the applicable building code, the point of discharge to the atmosphere shall remain located outside of the structure and away from any window, ventilation opening or exit.	605.17.3 Emergency ventilation system discharge. The point of discharge to the atmosphere shall remain located outside of the structure and away from any window, ventilation opening or exit in accordance with the applicable building code.	Operations and maintenance language, not construction. This section ensures an approved location remains where the emergency ventilation should discharge. Technically, the discharge may contain some flammable concentrations so, as a precaution, the prescribed distances from the building and openings are necessary to be maintained. These distances are usually consistent with Section 605.12.2 for flammable refrigerants being discharged from treatment systems.
56	CA		606.1 Operation. Existing elevators with a travel distance of 25 feet (7620 mm) or more shall comply with the requirements of Section 606.5 and the USBC, Part III, Maintenance.	Corrects reference to 606
57	CA		606.2 Standby power. In buildings and structures where standby power is required or furnished to operate an elevator, standby power shall be maintained in accordance with Section 1203. Operation of the system shall be in accordance with Sections 606.2.1 through 606.2.4.	Corrects reference to 1203 and 606
58	CA		606.5 Occupant evacuation elevator lobbies. Where occupant evacuation elevators are provided in accordance with the applicable building code, occupant evacuation elevator lobbies shall be maintained free of storage and furniture.	Corrects sentence structure
59	CA		701.7 Unsafe conditions. Where any components in this chapter are not maintained and do not function as intended or do not have the fire resistance required by the code under which the building was constructed, remodeled or altered, such components or portion thereof shall be deemed an unsafe condition in accordance with Section 110.1. Components or portions thereof determined to be unsafe shall be repaired or replaced to conform to that code under which the building was constructed, remodeled, or altered or this chapter, as deemed appropriate by the fire code official. Where the extent of the conditions of components is such that any building, structure, or portion thereof presents an imminent danger to the occupants of the building, structure, or portion thereof, the fire code official shall act in accordance with Section 110.5.	Correct first reference from 110.1.1 to just 110.1
60	CA		704.2 Opening protectives. Where openings are required to be protected, opening protectives and associated closing devices shall be maintained as self-closing or automatic-closing in accordance with Section 705.2.	Adds reference to 705.2 for maintenance requirements of "opening protectives" which includes language about replacing fusible links which was removed from this section in the 2015 edition.
61	CA	705.2.2 Signs. Where required by the fire code official, a sign shall be permanently displayed on or near each fire door in letters not less than 1 inch (25 mm) high to read as follows: 1. For doors designs to be kept normally open: FIRE DOOR-DO NOT BLOCK 2. For doors designs to be kept normally closed: FIRE DOOR-KEEP CLOSED	705.2.2 Signs. ***Delete amendment	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
62	CA	705.2.3 Hold-open devices and closers. Hold-open devices and automatic door closers, where provided, shall be maintained. During the period that such device is out of service for repairs, the door it operates shall remain in the closed position.	705.2.3 Hold-open devices and closers. ***Delete amendment	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
63	CA	705.2.4 Door operation. Swinging fire doors shall close from the full-open position and latch automatically.	705.2.4 Door operation ***Delete amendment	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment. The reference to "applicable building code" is not needed. This is operational language, not maintenance.
64	CA	707.1 Fireblocking and draftstopping. Required fireblocking and draftstopping in combustible concealed spaces shall be maintained to provide continuity and integrity of the construction.	707.1 Fireblocking and draftstopping. ***Delete amendment	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
65	CA		803.1.1.1. Manufacturer's product information and testing reports. Manufacturer's product information and testing reports shall be furnished to the Fire Official upon request.	Totally revised section to clarify that product information, testing and classification data shall be provided to the Fire Official upon request. Similar to IFC 804.3.2 which has been deleted.
66	CA		803.2 Stability. Interior finish materials regulated by this chapter shall remain applied or otherwise fastened in accordance with the applicable building code.	Changed "be" to "remain"

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79	CA		803.3 Interior finish requirements. Interior wall and ceiling finish shall have a flame spread index not greater than that approved under the applicable building code. New interior finish shall not be installed unless approved by the Building Official in accordance with the applicable building code.	Clarifies that interior finish shall not be changed unless approved by the building official.
80	CA		803.5 Textile Wall Coverings. Where used as interior wall or ceiling finish materials, textiles, including materials having woven or nonwoven, napped, tufted, looped or similar surface, shall comply with the requirements of the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Restores language deleted from 803.5.2 to indicate newly installed material must be approved by the building official.
81	CA		803.6 Textile ceiling coverings. Where used as interior wall or ceiling finish materials, textiles, including materials having woven or nonwoven, napped, tufted, looped or similar surface, shall comply with the requirements of the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Restores the format of the 2018 IFC.
82	CA		803.7 Expanded vinyl wall coverings. Expanded vinyl wall coverings shall be maintained in accordance with the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Adds statement about building official approval for new installations
83	CA		803.8 Expanded vinyl ceiling coverings. Expanded ceiling coverings shall be maintained in accordance with the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Adds statement about building official approval for new installations
84	CA		803.9 High-density polyethylene (HDPE) and polypropylene (PP). Where high-density polyethylene or polypropylene is used as an interior finish, it shall comply with the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Changes reference to 803.1.1 to "applicable building code" and adds statement about newly introduced materials.
85	CA		803.10 Site-fabricated stretch systems. Where used as newly installed interior wall or interior ceiling finish materials, site-fabricated stretch systems containing all three components described in the definition in Chapter 2 shall not be installed unless approved by the building official in accordance with the applicable building code.	Adds statement about building official approval for new installations
86	CA		803.11 Foam plastic materials. Foam plastic materials shall not be used as interior wall and ceiling finish or interior trim unless specifically approved by the Building Official in accordance with the applicable building code.	Adds statement about building official approval for new installations
87	CA		803.13 Laminated products factory produced with an attached wood substrate. Laminated products factory produced with an attached wood substrate shall be maintained in accordance with the applicable building code.	Provides maintenance language for new section.
88	CA		803.14 Thickness exemption. Materials having a thickness less than 0.036 inch (0.9mm) applied to the surface of walls or ceilings shall not be subject to interior finish requirements.	Changes "tested" to "subject to interior finish requirements" similar to the language in 803.14. This section provides an exemption for thin materials that are directly applied to the surfaces of walls or ceilings. It is not necessary for these thin materials to be tested or approved due to the negligible effect they have on the overall wall or ceiling construction fire performance.
89	CA		803.15 Heavy timber exemption. Exposed portions of buildings elements complying with the requirements of Type IV construction in accordance with the applicable building code, shall not be subject to interior finish requirements.	Changes IBC to "applicable building code"
90	CA		804.1 Interior trim. Combustible trim, as defined by the applicable building code, excluding handrails and guardrails, shall be maintained. Newly introduced materials shall not be installed unless approved by the Building Official.	Adds statement indicating that trim must be approved by the Building Official. Restores guidance for handrails and guards.
91	CAAM		804.2 Foam plastic. Foam plastic used as interior trim shall be maintained in accordance with the applicable building code. Newly introduced materials shall not be installed unless approved by the Building Official.	Adds statement indicating that trim must be approved by the Building Official.
92	CA		804.3 Interior floor finish. Interior floor finish and floor covering materials shall be maintained in accordance with the applicable building code.	Restores existing exemption. Traditional floor coverings, such as wood, vinyl, terrazzo and other resilient floor covering material, must be exempt from this section since they generally contribute minimally to a fire. The focus is on textile floor coverings such as carpets.
93	CAAM		804.3 Interior floor finish. Interior floor finish and floor covering materials shall be maintained in accordance with the applicable building code. Exception: Floor finishes and coverings of a traditional type, such as wood, vinyl, linoleum or terrazzo, and resilient floor covering materials that are not composed of fibers.	New section to clarify that manufacturer's product information is the source of maintenance and use requirements.
94	CA	Delete 804.3.2 Testing and identification.	Delete 804.3.2 Testing and identification.	Construction requirements
95	CA	Delete 804.3.3 Interior floor finish requirements.	Delete 804.3.3 Interior floor finish requirements.	Construction requirements
96	CA	Delete 804.3.3.1 Testing.	Delete 804.3.3.1 Testing.	Construction requirements
97	CA	Delete 804.3.3.2 Minimum critical radiant flux.	Delete 804.3.3.2 Minimum critical radiant flux.	Construction requirements
98	CA	Delete 804.4 Interior floor-wall base.	Delete 804.4 Interior floor-wall base.	Construction requirements
99	CA	Change the title of Section 806 to read: Section 806 Decorative Vegetation in Buildings	Change the title of Section 806, change Exception 1 and add exception 3 in Section 806.1.1 to read: Section 806 Decorative Vegetation in Buildings	Restores exceptions as currently provided in the 2015 SFPC and 2018 IFC. In the base document, DHCD removed the specific list of occupancy groups.
100	CAAM	1. Trees located in areas protected by an automatic sprinkler system in accordance with the applicable NFPA 13 standard shall not be prohibited in Groups A, E, M, R-1 and R-2. 2. Trees shall be permitted in places of worship in Group A occupancies.	1. Trees located in areas protected by an automatic sprinkler system in accordance with the applicable NFPA 13 standard shall not be prohibited in Groups A, E, M, R-1 and R-2. 3. Trees shall be permitted in places of worship in Group A occupancies.	Restores exceptions as currently provided in the 2015 SFPC and 2018 IFC. In the base document, DHCD removed the specific list of occupancy groups.
101	CAAM	Change exceptions 1 and 2 in section 807.2 to read: 1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and 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 installed in accordance with the applicable NFPA 13 standard, and where the material is installed in accordance with the applicable building code. 2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and 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 the applicable NFPA 13 standard.	Change exceptions 1 and 2 in section 807.2 to read: 1. In auditoriums in Group A, the permissible amount of curtains, draperies, fabric hangings and 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 installed in accordance with the applicable NFPA 13 standard, and where the material is installed in accordance with the applicable building code. 2. In Group R-2 dormitories, within sleeping units and dwelling units, the permissible amount of curtains, draperies, fabric hangings and 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 the applicable NFPA 13 standard.	Corrects inaccurate reference to the IBC and NFPA 13 standard.
102	CA	807.3 Acceptance criteria and reports. Where required to exhibit improved fire performance, curtains, draperies, fabric hangings and other similar combustible decorative materials suspended from walls or ceiling shall be tested by an approved agency and meet the flame propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 or exhibit a maximum rate of heat release of 100 kW when tested in accordance with NFPA 289, using the 20 kW ignition source. Reports of test results shall be prepared in accordance with the test method used and furnished to the fire code official upon request.	Amendment not needed. Keep IFC language for 807.3 Acceptance criteria and reports.	This is an error in the base document. Keep 807.3 matching the 2018 IFC.
103	CAAM	807.5.2.1 Storage in corridors and lobbies. Clothing and personal effects shall not be stored in corridors and lobbies. Exceptions: 1. Corridors protected by an approved automatic sprinkler system in accordance with the applicable NFPA 13 standard. 2. Corridors protected by an approved fire alarm system in accordance with the applicable NFPA 72 standard. 3. Storage in metal lockers, provided the minimum required egress width is maintained.	807.5.2.1 Storage in corridors and lobbies. Clothing and personal effects shall not be stored in corridors and lobbies. Exceptions: 1. Corridors protected by an approved automatic sprinkler system in accordance with the applicable NFPA 13 standard. 2. Corridors protected by an approved automatic smoke detection system in accordance with the applicable NFPA 72 standard. 3. Storage in metal lockers, provided the minimum required egress width is maintained.	Replaces the undefined term "fire alarm" with the defined term "automatic smoke detection system" and corrects NFPA 72 to applicable NFPA 72 standard.
104	CAAM	807.5.5.1 Storage in corridors and lobbies. Clothing and personal effects shall not be stored in corridors and lobbies. Exceptions: 1. Corridors protected by an approved automatic sprinkler system in accordance with the applicable NFPA 13 standard. 2. Corridors protected by an approved fire alarm system installed in accordance with the applicable NFPA 72 standard. 3. Storage in metal lockers, provided the minimum required egress width is maintained.	807.5.5.1 Storage in corridors and lobbies. Clothing and personal effects shall not be stored in corridors and lobbies. Exceptions: 1. Corridors protected by an approved automatic sprinkler system in accordance with the applicable NFPA 13 standard. 2. Corridors protected by an approved automatic smoke detection system installed in accordance with the applicable NFPA 72 standard. 3. Storage in metal lockers, provided the minimum required egress width is maintained.	Replaces the undefined term "fire alarm" with the defined term "automatic smoke detection system" and corrects NFPA 72 to applicable NFPA 72 standard.
105	CA	808.1 Wastebaskets and linen containers in Groups I-1, I-2, and I-3 occupancies and Group B ambulatory care facilities. Wastebaskets, linen containers, and other waste containers, including their lids, located in Groups I-1, I-2, and I-3 occupancies shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with the applicable building code. Exception: Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.	808.1 Wastebaskets and linen containers in Groups I-1, I-2, and I-3 occupancies and Group B ambulatory care facilities. Wastebaskets, linen containers, and other waste containers, including their lids, located in Groups I-1, I-2, and I-3 occupancies shall be constructed of noncombustible materials or of materials that meet a peak rate of heat release not exceeding 300 kW/m2 when tested in accordance with ASTM E 1354 at an incident heat flux of 50 kW/m2 in the horizontal orientation. Metal wastebaskets and other metal waste containers with a capacity of 20 gallons (75.7 L) or more shall be listed in accordance with UL 1315 and shall be provided with a noncombustible lid. Portable containers exceeding 32 gallons (121 L) shall be stored in an area classified as a waste and linen collection room and constructed in accordance with the applicable building code. Exception: Recycling containers complying with Section 808.1.2 are not required to be stored in waste and linen collection rooms.	Restores exception for recycling containers that comply with 808.1.2
106	CA	808.4 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall be approved by the Building Official in accordance with the applicable building code. Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with the applicable building code.	808.4 Combustible lockers. Where lockers constructed of combustible materials are used, the lockers shall be considered to be interior finish and shall be approved by the Building Official in accordance with the applicable building code. Exception: Lockers constructed entirely of wood and noncombustible materials shall be permitted to be used wherever interior finish materials are required to meet a Class C classification in accordance with the applicable building code.	Changes reference to 803 to approval by Building Official.
107	CA	901.4.3 Fire areas. Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with the applicable building code, such fire areas shall be maintained in accordance with Chapter 7 and the applicable building code.	901.4.3 Fire areas. Where buildings, or portions thereof, are divided into fire areas so as not to exceed the limits established for requiring a fire protection system in accordance with the applicable building code, such fire areas shall be maintained in accordance with Chapter 7 and the applicable building code.	Revised language to maintain fire resistance rated construction in accordance with Chapter 7.
108	CA	903.3 Installation and maintenance requirements. Automatic sprinkler systems shall be approved by the Building Official and installed in accordance with the applicable building code. Automatic sprinkler systems shall be maintained in accordance with Section 901.6.	903.3 Installation and maintenance requirements. Automatic sprinkler systems shall be approved by the Building Official and installed in accordance with the applicable building code. Automatic sprinkler systems shall be maintained in accordance with Section 901.6.	Clarifies that fire sprinkler systems shall be approved by the Building Official.
109	CA	903.3.7 Fire department connections. Fire department connections shall be maintained in accordance with Section 912.	903.3.7 Fire department connections. Fire department connections shall be maintained in accordance with Section 912.	Restores pointer to section 912 for Fire Department Connections
110	CA	903.3.8.1 Limited area sprinkler systems. Limited area sprinkler systems shall be maintained in accordance with the NFPA 25.	903.3.8.1 Limited area sprinkler systems. Limited area sprinkler systems shall be maintained in accordance with NFPA 25.	Clarifies that limited area systems must be maintained in accordance with NFPA 25.
111	CAAM	903.4 Sprinkler system supervision and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, water-flow switches and alarms on all sprinkler systems shall remain in service in the normal position and properly sealed, locked, or electrically supervised in accordance with the applicable building code.	903.4 Sprinkler system supervision and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, water-flow switches and alarms on all sprinkler systems shall remain in service in the normal position and properly sealed, locked, or electrically supervised in accordance with the applicable building code.	Restores the guidance as to which valves shall remain supervised. Does not require construction.
112	CA	904.3 Commercial hood and duct systems in mobile food preparation vehicles. Each required commercial kitchen exhaust hood and duct system required by Section 319.4 for mobile food preparation vehicles to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.	904.3 Commercial hood and duct systems in mobile food preparation vehicles. Each required commercial kitchen exhaust hood and duct system required by Section 319.4 for mobile food preparation vehicles to have a Type I hood shall be protected with an approved automatic fire-extinguishing system installed in accordance with this code.	Correlate with 319.4 so that they connect for mobile food preparation vehicles.
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114	CA		904.3.1 Installation. Automatic fire-extinguishing systems shall be installed in accordance with Annex B of NFPA 96 when required in mobile food preparation vehicles.	See above.
115	CA		904.2 Electrical wiring. Electrical wiring shall be maintained in accordance with NFPA 70.	Restores reference to maintaining electrical components in accordance with the applicable building code and NFPA 70.
116	CA		904.4 Warning signs. Where alarms are required to indicate the operation of automatic fire-extinguishing systems, warning signs shall be maintained to warn of pending agent discharge. Where exposure to automatic-extinguishing agents poses a hazard to persons and a delay is required to ensure the evacuation of occupants before agent discharge, a separate warning sign shall be maintained in accordance with the applicable building code.	Restores signage requirements. Safeguards are necessary to prevent injury or death to personnel in areas where the atmosphere will be made hazardous by oxygen depletion due to agent discharge in a confined space. The "where alarms are required" phrase is referring to requirements that will be found in the referenced installation standards. Pre-discharge alarms that will operate on fire detection system activation must be installed within and at entrances to the affected areas.  Where required by the appropriate installation standard, an extinguishing agent discharge delay feature shall also be provided to allow evacuation of personnel prior to agent discharge. Warning and instructional signs are also to be posted, preferably at the entrances to and within the protected area. See Section 4.5.6.1 of NFPA 12 for additional information on carbon dioxide system alarms, Section 4.3.5 of NFPA 12A for additional information on Halon system alarms and Section 4.3.5 of NFPA 2001 for additional information on clean agent system alarms.
117	CA		904.14 Aerosol fire-extinguishing systems. Aerosol fire-extinguishing systems shall be periodically inspected, tested and maintained in accordance with this section, NFPA 2010, and in accordance with their listing. Such devices and appurtenances shall be maintained in compliance with manufacturer's instructions.	Corrects references and adds the last sent which was not included in the base document version. Condensed aerosol fire suppression systems can be used as an alternative to other fire suppression systems for the protection of Class A (surface), Class B, and Class C hazards. These systems do not use compressed gas cylinders or pressure-rated piping. Generally, they are electrically operated when integrated with an 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.
118	CA		905.2 Maintenance standard. Standpipe systems shall be maintained in accordance with this section, NFPA 25 and as approved in accordance with the applicable building code including the applicable NFPA 14 standard. Hose connections shall be maintained so that there is at least 3 in. (76.2 mm) clearance between any adjacent object and the handle of the valve when the valve is in any position ranging from fully open to fully closed. Fire department connections for standpipe systems shall be in accordance with Section 912.	Changes appropriate standard from NFPA 14 to NFPA 25. Also provides operational clearance requirements so that a valve is accessible and can be used.
119	CAAM	905.3.4.1 Stage hose and cabinets. Where required by the applicable building code, stages greater than 1,000 square feet in area (93 m <sup>2</sup> ) with hose connections shall be maintained with sufficient lengths of 1-1/2-inch (38 mm) hose to provide fire protection for the required area. Hoses shall be maintained with an adjustable fog nozzle mounted in a cabinet or on a rack approved by the fire code official. Each rack for 1-1/2 inch (38 mm) or smaller hose shall be provided with a label that includes the wording "FIRE HOSE FOR USE BY TRAINED PERSONNEL" and operating instructions.	905.3.4.1 Stage hose and cabinets. Where required by the applicable building code, stages greater than 1,000 square feet in area (93 m <sup>2</sup> ) with hose connections shall be maintained with sufficient lengths of 1-1/2-inch (38 mm) hose to provide fire protection for the required area. Hoses shall be maintained with an approved adjustable fog nozzle mounted in a cabinet or on a rack. Each rack for 1-1/2 inch (38 mm) or smaller hose shall be provided with a label that includes the wording "FIRE HOSE FOR USE BY TRAINED PERSONNEL" and operating instructions.	Restores context language for this section applying to stages. Also adds consistent language for signs at occupant use hoses.
120	CA	Delete 905.3.7 Marinas and boatyards.	Delete 905.3.7 Marinas and boatyards.	no need to reference this special application if the others are not also referenced
122	CA	905.7 Cabinets. Cabinets containing fire-fighting equipment, such as standpipes, fire hose, fire extinguishers or fire department valves, shall not be blocked from use or obscured from view.	No amendment needed for 905.7 Cabinets. Same as IFC language.	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
123	CA	905.7.1 Cabinet equipment identification. Cabinets shall be identified in an approved manner by a permanently attached sign with letters not less than 2 inches (51 mm) high in a color that contrasts with the background color, indicating the equipment contained therein. Exceptions: 1. Doors not large enough to accommodate a written sign shall be marked with a permanently attached pictogram of the equipment contained therein. 2. Doors that have either an approved visual identification clear glass panel or a complete glass door panel are not required to be marked.	No amendment needed for 905.7.1 Cabinet equipment identification. Same as IFC language.	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
124	CA	905.7.2 Locking cabinet doors. Cabinets shall be unlocked. Exceptions: 1. Visual identification panels of glass or other approved transparent frangible material that is easily broken and allows access. 2. Approved locking arrangements. 3. Group I-3 occupancies.	No amendment needed for 905.7.2 Locking cabinet doors. Same as IFC language.	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
125	CA	905.9 Valve supervision. Valves controlling water supplies shall be maintained as supervised in accordance with the applicable building code. Where a fire alarm system is provided, a supervisory signal shall also be transmitted to the control unit. Exceptions: 1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision. 2. Valves locked in the normal position and inspected as permitted in the applicable building code in buildings not equipped with a fire alarm system.	905.9 Valve supervision. Valves controlling water supplies shall be maintained as supervised in accordance with the applicable building code. Where a fire alarm system is provided, a supervisory signal shall also be transmitted to the control unit. Exceptions: 1. Valves to underground key or hub valves in roadway boxes provided by the municipality or public utility do not require supervision. 2. Valves locked in the normal position and inspected as permitted in the applicable building code in buildings not equipped with a fire alarm system.	Similar to 903.4 for supervision of control valves. Does not require construction.
126	CA	905.11 Locking standpipe outlet caps. The fire code official is authorized to require locking caps on the outlets on dry standpipes where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.	905.11 Locking standpipe outlet caps. The fire code official is authorized to require locking caps on the outlets on dry standpipes where the responding fire department carries key wrenches for the removal that are compatible with locking FDC connection caps.	No need for VA amendment. This exact section is now in the 2018 IFC and no longer needs to be a state amendment.
127	CA	907.3.2 Special locking systems. Where special locking systems are installed on means of egress doors, the associated fire detection system shall also be maintained in accordance with NFPA 72 and the applicable building code.	907.3.2 Special locking systems. Where special locking systems are installed on means of egress doors, the associated fire detection system shall also be maintained in accordance with NFPA 72 and the applicable building code.	Provides additional language for context.
128	CAAM	907.3.3 Elevator emergency operation. Automatic fire detectors installed for elevator emergency operation shall be maintained in accordance with the provisions of the applicable ASME A17.1/CSA B44 standard, NFPA 72 and the applicable building code.	907.3.3 Elevator emergency operation. Automatic fire detectors installed for elevator emergency operation shall be maintained in accordance with the provisions of ASME A17.1/CSA B44, NFPA 72 and the applicable building code.	Restores reference to maintenance requirements of ASME A17.1 and NFPA 72.
129	CA	907.4.2 Manual fire alarm boxes. Where a manual fire alarm system is provided or required by the applicable building code, fire alarm boxes shall be maintained in accordance with Sections 907.4.2.1 through 907.4.2.6.	907.4.2 Manual fire alarm boxes. Where a manual fire alarm system is provided or required by the applicable building code, fire alarm boxes shall be maintained in accordance with Sections 907.4.2.1 through 907.4.2.6.	Provides scoping language for this section and subsequent sections.
132	CAAM	907.5 Occupant notification systems. Fire alarm system annunciation and occupant notification required by the applicable building code shall be maintained.	907.5 Occupant notification systems. Unless otherwise required by the applicable building code, a fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.4 and the applicable building code. Where a fire alarm system is required by the applicable building code, it shall be activated by: Automatic fire detectors. Automatic sprinkler system waterflow devices. Manual fire alarm boxes. Automatic fire-extinguishing systems. Exception: Where notification systems are allowed by the applicable building code to annunciate at a constantly attended location.	Restores the purpose and operational requirements of occupant notification fire alarm systems. Throughout the USBC, these devices are to activate a fire alarm signal.
133	CAAM	907.5.2 Audible alarms. The distinct sound emitted by audible alarm notification appliances and approved in accordance with the applicable building code is not to be used for any purposes other than that of a fire alarm. The required audibility and intelligibility of alarms shall be maintained in accordance with the applicable building code.	907.5.2 Audible alarms. Unless otherwise approved by the applicable building code, audible alarm notification appliances shall emit a distinctive sound that is not to be used for any purposes other than that of a fire alarm. The audibility and intelligibility of alarms shall be maintained in all areas in accordance with the applicable building code.	Operational requirements to avoid conflicts or degradation of sound with building changes.
135	CA	907.5.2.3 Alternative uses for emergency voice/alarm communication systems. The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided that the manual fire alarm use takes precedence over any other use.	907.5.2.3 Alternative uses for emergency voice/alarm communication systems. The emergency voice/alarm communication system shall be allowed to be used for other announcements, provided that the manual fire alarm use takes precedence over any other use.	Operational requirements for a voice evacuation alarm system.
136	CA	907.6.3 Initiating device identification. Fire alarm systems that identify the specific initiating device address, location, device type, floor level where applicable and status including indication of normal, alarm, trouble and supervisory status, shall maintain accurate programming in accordance with NFPA 72 and the applicable building code.	907.6.3 Initiating device identification. Fire alarm systems that identify the specific initiating device address, location, device type, floor level where applicable and status including indication of normal, alarm, trouble and supervisory status, shall maintain accurate programming in accordance with NFPA 72 and the applicable building code.	Provides additional context to this section. This is a programming item, not a general fire alarm maintenance problem. Changes in the description or layout of a building may require changes to be made to the programming to keep accurate descriptions.
137	CA	907.6.5 Access. Access shall be maintained to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.	907.6.5 Access. Access shall be maintained to each fire alarm device and notification appliance for periodic inspection, maintenance and testing.	Corrects sentence structure
138	CA	907.7.3 Instructions. Operating, testing and maintenance instructions and record drawings ("as built") and equipment specifications shall be provided at an approved location.	907.7.3 Instructions. Operating, testing and maintenance instructions and record drawings ("as built") and equipment specifications shall be provided at an approved location.	No need for VA amendment. This exact section is in the 2018 IFC and no longer needs to be a state amendment.
139	CA	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. Where automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annual. In Group R-1 occupancies, battery-powered single station smoke detectors shall be tested and inspected at one-month intervals. Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.	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. Where automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, the manual testing frequency shall be permitted to be extended to annual. In Group R-1 occupancies, battery-powered single station smoke detectors shall be tested and inspected at one-month intervals. Exception: Devices or equipment that are inaccessible for safety considerations shall be tested during scheduled shutdowns where approved by the fire code official, but not less than every 18 months.	Corrects reference to NFPA 72.
140	CA	907.8.5 Maintenance, inspection and testing. The building owner shall be responsible for maintaining the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for maintaining, inspecting and testing such systems. A written record shall be maintained and shall be made available to the fire code official. In addition to all applicable information contained in Figure 7.8.2 of NFPA 72, the written record of inspections, testing and maintenance shall contain the following minimum information: 1. Date, name and address of property. 2. Name of person performing inspection, maintenance and tests, or combination thereof, and affiliation, business address and telephone number. 3. Name, address and representative of approving agency or agencies. 4. Test frequency. 5. Designation of the standard or procedures used for the inspection or test (for example, "Test performed in accordance with NFPA 72 Section _____"). 6. List of each device tested and the result. The list should include the physical location and device description of each initiating and notification device tested (for example, "Heat detector in main kitchen; horn-strobe in Room 115"). 7. Other tests as required by either the equipment manufacturer's published instructions or the authority having jurisdiction. 8. Signature of tester and approved authority representative. 9. Disposition of problems identified during test or devices not tested (examples, "Owner notified," "Problem corrected or successfully retested, or both," "Device abandoned in place").	907.8.5 Maintenance, inspection and testing. The building owner shall be responsible for maintaining the fire and life safety systems in an operable condition at all times. Service personnel shall meet the qualification requirements of NFPA 72 for maintaining, inspecting and testing such systems. A written record shall be maintained and shall be made available to the fire code official. In addition to all applicable information contained in Figure 7.8.2 of NFPA 72, the written record of inspections, testing and maintenance shall contain the following minimum information: 1. Date, name and address of property. 2. Name of person performing inspection, maintenance and tests, or combination thereof, and affiliation, business address and telephone number. 3. Name, address and representative of approving agency or agencies. 4. Test frequency. 5. Designation of the standard or procedures used for the inspection or test (for example, "Test performed in accordance with NFPA 72 Section _____"). 6. List of each device tested and the result. The list should include the physical location and device description of each initiating and notification device tested (for example, "Heat detector in main kitchen; horn-strobe in Room 115"). 7. Other tests as required by either the equipment manufacturer's published instructions or the authority having jurisdiction. 8. Signature of tester and approved authority representative. 9. Disposition of problems identified during test or devices not tested (examples, "Owner notified," "Problem corrected or successfully retested, or both," "Device abandoned in place").	Revises existing list of items on annual fire alarm test records. Consolidates to a shorter and more direct list.

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141	CA		908.1 Group H occupancies. Emergency alarms for the detection and notification of an emergency condition in Group H occupancies shall be maintained as provided in accordance with the applicable building code and manufacturer's specifications.	Adds reference to manufacturer's specs
142	CA		908.2 Group H-5 occupancy. Emergency alarms for notification of an emergency condition in a hazardous production material (HPM) facility shall be maintained as provided in accordance with the applicable building code. Continuous gas detection systems shall be maintained for HPM gases as provided in accordance with the applicable building code and manufacturer's specifications.	Adds reference to manufacturer's specs
143	CA		909.1 Scope and purpose. This section applies to the inspection, testing, and maintenance of mechanical or passive smoke control systems. The purpose of these systems is 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 provisions found in Section 910.	Restores reference to 910 an difference between smoke control and smoke heat vents.
144	CA		909.5.3.2 Ducts, and air transfer openings. Protection of ducts and air transfer openings by smoke dampers shall be maintained in accordance with Chapter 7.	Added the term smoke dampers for reference.
145	CA	Delete section	909.10.5 Fans. ***Delete	Construction requirements
146	CAAM		909.11.2 Power sources and power surges. Elements of the smoke control system relying on volatile memories or the like shall be maintained with uninterruptible power sources of sufficient duration to span primary power interruption in accordance with the applicable building code. Elements of the smoke control system susceptible to power surges shall maintain protection by conditioners, suppressors or other approved means.	Restores technical language for maintenance of power sources.
147	CA	Agreement by group to not include "the applicable" in front of NFPA 72 or NFPA 25 where they are referenced related to maintenance. Applicable throughout the 2018 SFPD.		
148	CAAM	909.16 Fire fighter's smoke control panel. A fire fighter's smoke control panel for fire department emergency response purposes only, including manual control or override of automatic control for mechanical smoke control systems, shall be maintained in accordance with the applicable building code.	909.16 Fire fighter's smoke control panel. A fire fighter's smoke control panel for fire department emergency response purposes only shall be maintained in accordance with the applicable building code and, where provided or required, shall include manual control or override of automatic control for mechanical smoke control systems.	Restores critical guidance regarding the use and operation of Firefighter's smoke control panel which was deleted from the 2015 SFPD. One of the elements that makes a smoke control system effective is that its activity is successfully communicated to the fire department and the fire department is able to manually operate the system. This panel should be located with the fire alarm panel. The specific location will depend on the needs of the fire department in that jurisdiction. There are two components that include the requirements for the display and for the controls. This control panel will provide an ability to override any other controls, whether manual or automatic, within the building as they relate to the smoke control system.
149	CA		909.20.1 Schedule. A routine maintenance and operational testing program shall be initiated immediately after the smoke control system has passed the acceptance tests. A written schedule for routine maintenance and operational testing shall be established and approved by the fire code official.	Removed generic reference to Chapter 9. No need to reference Chapter 9 of the applicable building code for a maintenance schedule.
150	CA	909.21 Elevator hoistway pressurization alternative. Where elevator hoistway pressurization is provided in lieu of required enclosed elevator lobbies, the pressurization system shall comply with Sections 909.21.1 through 909.21.11.	909.21 Elevator hoistway pressurization alternative. ***Keep IFC scoping language, no amendment needed	No need for VA amendment. This section in the 2018 IFC is scoping language and no longer needs to be a state amendment.
151	CA	Delete	Delete 909.21.4 Fan system.	Construction requirements
152	CA	Delete	Delete 909.21.4.1 Fire resistance.	Construction requirements
153	CAAM	909.21.6 Activation of pressurization system. Where required or provided in accordance with the applicable building code, activation of the elevator pressurization system by the building fire alarm system or the elevator lobby smoke detectors shall be maintained.	909.21.6 Activation of pressurization system. Unless otherwise required by the applicable building code, the elevator pressurization system shall be activated upon activation of either the building fire alarm system or the elevator lobby smoke detectors.	Operational requirements for smoke pressurization systems. This section notes that the pressurization system should be activated when the general building fire alarm system or an elevator lobby smoke detector is activated. All buildings using this pressurization option will more than likely be required to have both. Highrise buildings require elevator lobby smoke detectors, but other buildings may not.
154	CAAM	909.21.8 Marking and identification. Detection and control systems shall be marked in accordance with Section 909.14	909.21.8 Marking and identification. ***Keep IFC language, no amendment needed	No need for VA amendment. This exact section is in the 2018 IFC and no longer needs to be a state amendment.
155	CA	909.21.9 Control diagrams. Control diagrams shall be provided in accordance with Section 909.15.	909.21.9 Control diagrams. ***Keep IFC language, no amendment needed	No need for VA amendment. This exact section is in the 2018 IFC and no longer needs to be a state amendment.
156	CA	Delete	Delete 909.21.11 System response time.	Construction requirement. Section 909.17 covers response times for all systems
157	CA	Delete	Delete 909.21.11 System response time.	Construction requirement. Section 909.17 covers response times for all systems
158	CAAM	910.1 General. Maintenance and operation of smoke and heat vents or mechanical smoke removal systems shall conform to the requirements of this section.	910.1 General. Keep the IFC, no amendment needed	No need for VA amendment. This exact section is in the 2018 IFC and no longer needs to be a state amendment.
159	CA		910.4 Mechanical smoke removal systems. Mechanical smoke removal systems provided shall be maintained in accordance with this Section and the applicable building code.	Provided for scoping of 910.4.4 and 910.4.7
160	CAAM	910.4.4 Activation. Where the applicable building code requires that a mechanical smoke removal system shall be activated by manual controls only, only manual controls shall be permitted.	910.4.4 Activation. Unless otherwise required by the applicable building code, the mechanical smoke removal system shall be activated by manual controls only.	Operational guidance for smoke and heat vents. This section highlights that mechanical systems are to be activated manually so that the fire department is in control of the system. In some situations, automatic operation could cause a fire to grow or spread, opening an excessive number of sprinklers. Automatic operation of the mechanical smoke removal system could also be detrimental to the operation of the sprinkler system in a manner similar to draft curtains. The effect of the automatic mechanical smoke removal system on sprinkler operation would depend on when the system was activated. The sooner the system is automatically activated, the greater the detrimental effect. The fire department will retain the option to shut down the exhaust system.
161	CAAM	910.4.7 Controls. Where the applicable building code requires that manual controls be provided for the smoke removal system that have the capability to override the automatic shutdown of fans that are part of the smoke removal system, the override capability shall be maintained.	910.4.7 Controls. Where provided or required by the applicable building code, the manual controls provided for the smoke removal system shall maintain the capability to override the automatic shutdown of fans that are part of the smoke removal system.	Critical manual override control. This section notes that if a mechanical smoke removal system is integrated with a standard HVAC system, then the system should shut down upon detection of smoke as required by the applicable building code. This relates to the requirement in Section 910.4.4 that mechanical smoke removal systems shall be manually operated only.  The concern is that HVAC systems should not work against the intended operation of the smoke exhaust system. In some cases, the system may be a combination system where shutdown is not necessary or appropriate. It really depends on how the smoke exhaust system has been designed.
162	CAAM	911.1 General. Explosion control systems and components shall be maintained and operated in accordance with the applicable provisions of NFPA 69 or NFPA 495. Deflagration venting shall not be used as a means to protect buildings from detonation hazards.	911.1 General. Explosion control systems and components shall be provided in accordance with the applicable building code and maintained and operated in accordance with NFPA 69, or NFPA 495, as applicable. Deflagration venting shall not be used as a means to protect buildings from detonation hazards.	Corrects sentence structure
163	CAAM	913.1 General. Fire pumps shall be maintained in accordance with this section, the applicable NFPA 20 standard, NFPA 25 and the applicable building code.	913.1 General. Fire pumps shall be maintained in accordance with this section, NFPA 20 and NFPA 25.	Restores reference to NFPA 20 and 25 for maintenance.
164	CAAM	913.2 Protection against interruption of service. The fire pump, driver and controller shall be maintained in accordance with the applicable building code against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, freezing, vandalism and other adverse conditions.	913.2 Protection against interruption of service. The fire pump, driver and controller shall be protected in accordance with the applicable building code against possible interruption of service through damage caused by explosion, fire, flood, earthquake, rodents, insects, windstorm, vandalism and other adverse conditions.	Provides context for this section regarding what protection needs to be maintained and for what hazards. This section lists hazards that must be taken into account when determining the extent of protection required to be maintained for the fire pump and its auxiliary equipment. Because fire pumps are also often located in separate detached structures, geographical and security issues must also be considered.
165	CA		913.4 Valve supervision. Where provided, the fire pump suction, discharge and bypass valves, and isolation valves on the backflow prevention device or assembly shall be maintained as supervised in accordance with the applicable building code. Where a fire alarm system is provided, a supervisory signal shall also be transmitted to the control unit.	Similar to 903.4 and 905 for supervision of control valves. Does not require construction.
166	CA		Exceptions: 1. Valves locked in the normal position and inspected as permitted in the applicable building code in buildings not equipped with a fire alarm system.	
167	CA	Delete section	Delete Section 914	Requirements already exist in section 509.
168	CA		916.1 Gas detection systems. Gas detection systems shall be maintained in accordance with the applicable building code and this section.	Adds scoping language
169	CA	Delete sections	Delete 916.2 and 916.2.1	Construction requirements
170	CA		916.3 Equipment. Gas detection system equipment shall be operated and maintained in accordance with the applicable building code and manufacturer's instructions.	Revised to maintenance language
171	CA		916.4 Power connections. Gas detection systems shall remain permanently connected to the building electrical power supply or, where approved by the applicable building code, cord connected to an unswitched receptacle using an approved restraining means that secures the plug to the receptacle.	Revised to maintenance language
172	CA		916.5 Emergency and standby power. Standby or emergency power shall be maintained in accordance with Section 1203. Where required by the applicable building code, the gas detection system shall initiate a trouble signal at an approved location if the power supply is interrupted.	Revised to maintenance language
173	CA		916.6 Sensor locations. Sensors shall remain in approved locations where leaking gases are expected to accumulate.	Operational requirement for the use of gas detection sensors.
174	CAAM	Delete section	Delete 916.7 Gas sampling	Construction requirements
175	CA		916.9 Signage. Signs shall be provided and maintained 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.	Revised to maintenance language
176	CA		916.10 Fire alarm system connections. Gas sensors and gas detection systems shall not be connected to fire alarm systems unless approved in accordance with the applicable building code and connected in accordance with the fire alarm equipment manufacturer's instructions.	Added the term applicable building code. This section notes that where gas sensors and gas detection systems are approved to be connected to a fire alarm system, they are only to be connected in conformance to the equipment manufacturer's written instructions. This ensures that the fire alarm system will operate as required in response to the independent operation of the gas detection system.
177	CA		916.11 Inspection, testing and sensor calibration. ***Use IFC language, no amendment needed.	No need for VA amendment. This exact section is in the 2018 IFC and no longer needs to be a state amendment.
178	CA		917.1 Mass notification. Where provided, mass notification systems shall be maintained in accordance with NFPA 72.	Revised to maintenance language
179	CA		1001.4.1 Unsafe occupancy. Where a maximum occupant load is not to be identified and contributes to an unsafe condition in accordance with 110.4 or where an occupant load is not regulated by the USBC, the IFC may be used by the fire code official to calculate safe occupant loads within a building, space or area. NOTE: Permanent occupant loads are determined by the Building Official in accordance with the applicable building code and are always to be used whenever available.	Provides a means for the Fire Official to determine safe occupant loading when no official load is posted or where the building code does not apply.
180	CAAM	1001.3.1 Temporary occupant load determination. Where the fire code official determines that overcrowding may exist, the fire code official shall be permitted to utilize the egress component sizing requirements and occupant load allowances of the VCC to determine a temporary occupant load. Where such determination is made, the fire code official shall be permitted to require an approved temporary sign posting of the maximum allowable occupant load and such sign shall be maintained until the building official approves the allowable occupant load at which time a permanent sign shall be posted, where applicable, or the temporary sign may be removed.		
181	CAAM		1003.3.2 Post-mounted objects. Clearances for a free-standing object mounted on a post or pylon shall be maintained in accordance with the applicable building code.	Requirements for objects hung from a post or pylon are needed for maintenance purposes.
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183	CAAM	1003.3.3 Horizontal projections. Limitations of projection of objects into a means of egress in accordance with the applicable building code shall be maintained and not reduce the means of egress.	1003.3.3 Horizontal projections. Objects projecting into a means of egress shall be maintained in accordance with the applicable building code.	Requirements for horizontal projections are needed for maintenance purposes.
184	CA		1003.4 Floor surface. Walking surfaces shall be maintained in accordance with the applicable building code. Slip and trip hazards in the means of egress shall be abated.	Requirements for the maintenance of walking surfaces and slip/trip hazards are needed for maintenance purposes.
185	CA		1003.5 Elevation change. Where changes in elevation in the means of egress exist they shall be maintained in accordance with the applicable building code.	Requirements for the maintenance of changes in elevation are needed for maintenance purposes.
186	CAAM	1003.6 Means of egress continuity. Means of egress continuity shall be maintained in accordance with the applicable building code. Obstructions, except those permitted by the applicable building code, shall not reduce the minimum width or required capacity of means of egress components.	1003.6 Means of egress continuity. Means of egress continuity shall be maintained in accordance with the applicable building code. Obstructions, except those permitted by the applicable building code, shall not be placed as to reduce the minimum width or required capacity of means of egress components.	Requirements for the maintenance of the continuity of means of egress are needed for maintenance purposes.
187	CAAM	1003.7 Elevators, escalators and moving walks. Elevators, escalators and moving walks that are an approved component of a required means of egress shall be maintained in accordance with the applicable building code.	1003.7 Elevators, escalators and moving walks. Elevators, escalators and moving walks shall not be used as a component of a required means of egress from any other part of the building in accordance with the applicable building code.	Prohibiting the use of the elevators, escalators, and moving walks as a means of egress are needed for maintenance and operational purposes.
188	CA		1005.7.1 Doors. Doors shall be maintained such that when fully opened, shall not reduce the required width by more than what is permitted by the applicable building code. Door swing in any position shall not reduce the required width by more than one-half unless allowed by the applicable building code.	Operational requirements for door swing operations in the egress path.
189	CAAM	1005.7.2 Other projections. Other projections shall be maintained and shall be in accordance with the applicable building code.	1005.7.2 Other projections. Other projections shall be maintained and shall be in accordance with the applicable building code. Other nonstructural projections such as trim and similar decorative features shall be permitted to project into the required width not more than what is permitted by the applicable building code.	Requirements for other projections are needed for maintenance purposes.
190	CAAM	1006.2.1 Egress based on occupant load and common path of egress travel distance. The minimum number of exits or exit access doorways required by the applicable building code from any space shall be maintained.	1006.2.1 Egress based on occupant load and common path of egress travel distance. The number of exits or exit access doorways from any space shall be maintained in accordance with the applicable building code.	Revised to maintenance language
191	CAAM	1006.2.1.1 Three or more exits or exit access doorways. Where three or more exits or exit access doorways are required by the applicable building code, the number required shall be maintained.	1006.2.1.1 Three or more exits or exit access doorways. Three exits or exit access doorways shall be maintained where required and in accordance with the applicable building code.	Revised to maintenance language. Highlights additional requirements when three or more exits are required.
192	CAAM	1006.2.2 Egress based on use. The minimum number of exits or access to exits required by the applicable building code shall be maintained. Approved egress for boiler, incinerator and furnace rooms, refrigeration machinery rooms, refrigerated rooms or spaces, I-4 Day Care, vehicular ramps, and R-3 or R-4 occupancies or spaces shall be maintained in accordance with the applicable building code.	1006.2.2 Egress based on use. The minimum number of exits or access to exits shall be maintained. Boiler, incinerator and furnace rooms, refrigeration machinery rooms, Refrigerated rooms or spaces, I-4 Day Care, vehicular ramps, and R-3 or R-4 occupancies or spaces shall be maintained in accordance with the applicable building code.	This section is needed to point the fire inspector to the fact that additional requirements may be present in the applicable building code.
193	CAAM	1006.3.1 Adjacent Story. A path of travel, approved in accordance with the applicable building code, that passes through an adjacent story shall be maintained.	1006.3.1 Adjacent Story. The path of travel shall be maintained and not pass through more than one adjacent story unless approved by the applicable building code.	This section is needed to point the fire inspector to the fact that additional requirements may be present in the applicable building code. Table 1006.3.1 does not exist in the 2018 IFC and does not need to be deleted.
194	CAAM	1006.3.2 Egress based on occupant load. Each story and roof of a building shall maintain the minimum number of separate and distinct exits required by the applicable building code.	1006.3.2 Egress based on occupant load. Each story and roof of a building shall maintain the minimum number of separate and distinct exits as required and in accordance with the applicable building code.	This section is needed to point the fire inspector to the fact that additional requirements may be present in the applicable building code.
195	CA	Delete table	Delete Table 1006.3.2	Construction requirements
196	CAAM	1006.3.3 Single exits. A single exit or access to a single exit from any story or occupied roof shall be maintained in accordance with the applicable building code shall be maintained.	1006.3.3 Single exits. A single exit or access to a single exit from any story or occupied roof shall be maintained as the single means of egress only where permitted by the applicable building code.	This section is needed to point the fire inspector to the fact that additional requirements may be present in the applicable building code.
197	CA		1008.2.1 Illumination level under normal power. The means of egress illumination level required by the applicable building code shall be maintained.	Revised to maintenance language. Note that the IFC has a reference problem. Section 1010.6.1 should be Section 1010.1.6.
198	CA		1008.2.3 Exit discharge. Illumination required by the applicable building code along the path of travel for the exit discharge from each exit to the public way shall be maintained.	Restores reference to maintaining the elements of the exit discharge to the public way.
199	CA		1008.3.5 Illumination level under emergency power. Emergency lighting facilities required and approved by the applicable building code shall be maintained.	Restores reference to maintaining emergency lighting.
200	CAAM	1010.1.5 Floor elevation. Floors or landings at doorways shall be maintained in accordance with the applicable building code.	1010.1.5 Floor elevation. Where floor or landings are provided at a doorway they shall be maintained in accordance with the applicable building code.	Restores maintenance language for landings.
201	CAAM	1010.1.9 Door arrangement. Minimum space between doors in a series of doors shall be maintained as approved in accordance with the applicable building code.	1010.1.9 Door arrangement. Space between doors in a series of doors shall be maintained as approved and in accordance with the applicable building code.	Restores maintenance language for space between doors.
202	CAAM	1010.1.9 Door Operations. Locks and latches approved in accordance with the applicable building code shall be maintained. Except as specifically permitted by the applicable building code, egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.	1010.1.9 Door Operations. Locks and latches shall be permitted to prevent operation of doors where permitted by the applicable building code. Except as specifically permitted by the applicable building code, egress doors shall be readily openable from the egress side without the use of a key or special knowledge or effort.	Add a sentence to clarify that new or modified locks and latch operations must be approved by the building official.
203	CAAM	1010.1.9.1 Hardware. Door handles, pulls, latches, locks and other operating devices on doors required by the applicable building code to be accessible shall be maintained. Additions or alterations of hardware shall be approved by the building official in accordance with Section 102.6.	1010.1.9.1 Hardware. Door handles, pulls, latches, locks and other operating devices on doors required to be accessible shall be maintained in accordance with the applicable building code. Additions or modifications of hardware shall be approved in accordance with the applicable building code.	Add a sentence to clarify that new or modified door hardware must be approved by the building official.
204	CAAM	1010.1.9.3 Monitored or recorded egress. Electrical systems that monitor or record egress activity and impact the door operations shall be approved in accordance with the applicable building code and shall be maintained in accordance with this section.	1010.1.9.3 Monitored or recorded egress. Where electrical systems that monitor or record egress activity are incorporated they shall be operated and maintained in accordance with the applicable building code.	Restores model code language to indicate that special monitoring devices in the egress path must be approved by the building official.
205	CAAM	1010.1.9.5 Bolt locks. Manually operated flush bolts or surface bolts approved in accordance with the applicable building code shall be maintained.	1010.1.9.5 Bolt locks. Manually operated flush bolts or surface bolts shall only be located where approved in accordance with the applicable building code.	Limits the application of bolt locks to only those location where approved by the building official.
206	CAAM	1010.1.9.6 Unlatching. Where the applicable building code requires that the unlatching of any door or leaf require no more than one operation, one operation shall be maintained.	1010.1.9.6 Unlatching. The unlatching of any door or leaf shall not require more than one operation unless approved and in accordance with the applicable building code.	Limits the movement for unlatching unless approved by the building official.
207	CAAM	1010.1.9.6.1 Closet doors. Where closet doors that latch in the closed position are required by the applicable building code to be openable from the inside, they shall be maintained.	1010.1.9.6.1 Closet doors. Closet doors that latch in the closed position shall be maintained as approved and in accordance with the applicable building code.	Restores reference to the applicable building code for securing of closet doors.
208	CA		1010.1.9.7 Controlled egress doors in Groups I-1 and I-2. Electric locking systems, including electromechanical locking systems and electromagnetic locking systems shall be operated and maintained in accordance with the applicable building code.	Notes additional requirements may be required by the applicable building code for electric locking systems.
209	CAAM	1010.1.9.8 Delayed egress. Delayed egress locking systems shall be operated and maintained in accordance with the applicable building code.	1010.1.9.8 Delayed egress. Delayed egress locking systems shall be maintained and located only where permitted by the applicable building code.	Notes additional requirements may be required by the applicable building code for delayed egress systems.
210	CA		1010.1.9.9 Sensor release of electrically locked egress doors. The electric locks on sensor-released doors located in a means of egress shall be operated and maintained in accordance with the applicable building code.	Notes additional requirements may be required by the applicable building code for sensor release locking systems.
211	CA		1010.1.9.10 Door hardware release of electrically locked egress doors. Door hardware release of electric locking systems installed on doors in the means of egress shall be operated and maintained in accordance with the applicable building code.	Operation and maintenance of door hardware release for electronically locked doors.
212	CA		1010.1.9.11 Locking arrangements in buildings within correctional facilities. In buildings within correctional and detention facilities, doors in means of egress serving rooms or spaces occupied by persons whose movements are controlled for security reasons shall be operated and maintained in accordance with the applicable building code.	Notes additional requirements may be required by the applicable building code for locking within correctional facilities.
213	CAAM	1010.1.9.12 Stairway doors. Interior stairway means of egress doors required by the applicable building code to be openable from both sides shall be maintained.	1010.1.9.12 Stairway doors. Interior stairway means of egress doors shall be openable from both sides as approved and in accordance with the applicable building code.	Based on adverse fire experience where occupants have become trapped in smoke-filled stairway enclosures, stairway doors generally must be arranged to permit reentry into the building without the use of any tools, keys or special knowledge or effort.
214	CAAM	1010.1.10 Panic and fire exit hardware. Where the applicable building code requires panic or fire exit hardware on doors it shall be maintained.	1010.1.10 Panic and fire exit hardware. Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall be maintained as approved and in accordance with the applicable building code.	Notes that panic and fire exit hardware must be maintained, particularly in the occupancies listed. Swinging doors that are part of a means of egress from the locations listed in this section shall not be provided with a latch or lock other than panic hardware or fire exit hardware unless otherwise approved by the applicable building code. Fire exit hardware is essentially panic hardware that has been tested and listed for use on fire-rated doors.
215	CA		1010.2 Gates. Gates serving the means of egress system shall be operated and maintained in accordance with the applicable building code.	Revised to operations and maintenance language.
216	CA		1010.3 Turnstiles and similar devices. Turnstiles or similar devices shall be operated and maintained in accordance with the applicable building code.	Revised to operations and maintenance language.
217	CA		1010.3.2 Security access turnstiles. Security access turnstiles that inhibit travel in the direction of egress shall only be maintained and only operated in accordance with the applicable building code.	Operational language for security access turnstiles.
218	CA		1011.1 General. Stairways serving any portion of a building shall be maintained in accordance with the applicable building code.	Remove the term "occupied" since this section reference to maintenance not
219	CAAM	1011.5.1 Dimensional uniformity. Stair tread and riser dimensions shall comply with the applicable building code and shall be maintained.	1011.5.1 Dimensional uniformity. Unless otherwise approved in accordance with the applicable building code, stair treads and risers shall remain of uniform size and shape. Where carpeting, rugs or runners are provided, they are to be attached to all tread and landing surfaces in the stairway. The tread and landing surfaces shall be consistent and comply with the applicable building code prior to the addition or modification of carpet, rugs or runners. The tolerance between the largest and smallest riser height or between the largest and smallest tread depth shall not exceed 3/8 inch (9.5 mm) in any flight of stairs. The greatest winder tread depth at the walkline within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).	Carpet, rugs and runners, like furniture, are frequently changed by the occupants and are not regulated by the code. For this reason, it is essential that the riser height and tread depth be regulated exclusive of these transitory surfaces to provide an enforceable standard. This practice minimizes possible variation due to the removal of nonpermanent carpeting throughout the life of a structure and provides a standard enforcement methodology that will provide consistency across the built environment for all users. Where owners or occupants add carpeting, rugs or runners, they need to add it to all tread and landing surfaces in the stairway. It is important that the tread and landing surfaces are consistent and comply with the code prior to the addition of carpet. This methodology of enforcement makes it unnecessary to reconstruct floor and stair elevations in the stairway where nonpermanent carpet surfaces that do not require a building permit are changed and eliminates the resulting variations in the built environment that would not comply with the tolerance in Section 1011.5.4 (see Commentary Figure 1011.5.1).
220	CA		1011.6 Stairway landings. The floor or landing at the top and bottom of each stairway shall be maintained in accordance with the applicable building code.	Notes that stairway landings may have additional requirements by the applicable building code.
221	CAAM	1011.7 Stairway arrangement. Stairways shall be maintained in accordance with the applicable building code. Construction or alterations shall be approved by the building official in accordance with Section 102.6.	1011.7 Stairway arrangement. Stairways shall be maintained in accordance with the applicable building code. Construction or modifications shall be approved in accordance with the applicable building code.	Highlights that construction or modification of stairway arrangements required approval by the building official.
222	CAAM	1011.7.3 Storage and enclosures under interior stairways. The usable spaces under enclosed and unenclosed stairways shall only be used for combustible storage where approved in accordance with the applicable building code.	1011.7.3 Storage and enclosures under interior stairways. The usable spaces under enclosed and unenclosed stairways shall only be used for combustible storage where protected in accordance with the applicable building code. Unless otherwise approved by the applicable building code, access to an enclosed space shall not be directly from within the stairway enclosure.	Regulates the storage under stairways but does not require construction. This section addresses the fire hazard of storage under an interior stairway, whether it is an exit access stairway or exit stairway. The stairway must remain protected from a storage area under it, even if the stairway is not required to be enclosed. The section also reminds that the storage area not open into a stairway enclosure. This limits the potential of a fire that starts in the storage area from affecting the means of egress.
223	CAAM	1011.7.4 Storage and enclosures and storage under exterior stairways. The usable spaces under exterior stairways shall only be used for combustible storage where approved in accordance with the applicable building code.	1011.7.4 Storage and enclosures and storage under exterior stairways. The usable spaces under exterior stairways shall only be used for combustible storage or any other purpose where protected in accordance with the applicable building code.	Restores requirements for storage under exterior stairways. If the space under an exterior stairway is to be used, such as for storage, the area below the stairway must be approved by the applicable building code. If the space under the exterior stairway is open, it must remain free and clear. A fire occurring in this space would jeopardize the use of the stairway for exiting during an emergency.
224	CAAM	1011.12.1 Stairway to elevator equipment. Access to roofs and penthouses for maintenance of elevator equipment shall be maintained as approved in accordance with the applicable building code.	1011.12.1 Stairway to elevator equipment. Roofs and penthouses containing elevator equipment that must be accessed for maintenance shall be maintained as approved and in accordance with the applicable building code.	Restores maintenance requirements for stairways to elevator equipment on roofs and penthouses.
225	CA		1011.12.2 Roof access. Where a stairway provides access to a roof through a penthouse such access shall be maintained as approved and in accordance with the applicable building code.	Restores reference to requirements for maintaining roof access in accordance with the applicable building code.
226	CA		1011.16 Ladders. Permanent ladders shall be maintained as approved and in accordance with the applicable building code.	Restores reference to requirements for access and egress ladders in accordance with the applicable building code.
227	CA		1012.5 Minimum dimensions. The minimum dimensions of means of egress ramps shall be maintained as approved and in accordance with the applicable building code.	Restores maintenance language for the minimum size of ramps.

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228	CAAM	1012.7 Ramp construction. Ramps shall be maintained as approved in accordance with the applicable building code. Construction or alterations shall be approved by he building official in accordance with Section 102.6.	1012.7 Ramp construction. Ramps shall be maintained in accordance with the applicable building code. Construction or modifications shall be approved in accordance with the applicable building code.	Clarifies that any ramp construction must be approved by the building official.
229	CA		1014.8 Projections. Projections into the required width of aisles, stairways and ramps at each side shall be maintained as approved and in accordance with the applicable building code.	Restores maintenance requirements for projections into aisles.
230	CAAM	1015.8.1 Window opening control devices. Window opening control devices shall be maintained as approved in accordance with the applicable building code.	1015.8.1 Window opening control devices. Window opening control devices shall be maintained in accordance with the applicable building code.	Notes that window opening control devices may have additional requirements by the applicable building code.
231	CA		1016.2.1 Multiple tenants. Where more than one tenant occupies any one floor of a building or structure, each tenant space, dwelling unit and sleeping unit means of egress shall maintain access to the required exits without passing through adjacent tenant spaces, dwelling units and sleeping units unless otherwise permitted by the applicable building code.	Revises the section to maintenance language for critical egress coordination between multiple tenants. Where a floor is occupied by multiple tenants, each tenant should be provided with full and direct access to the required exits serving that floor without passing through another tenant space. Tenants typically lock the doors to their spaces for privacy and security. Should an egress door that is shared by both tenants be locked, occupants in one of the spaces could be trapped and unable to reach a secondary exit. Therefore, an egress layout where occupants from one tenant space travel through another tenant space to gain access to one of the required exits from that floor is prohibited.
232	CAAM	1020.1 Maintenance. Corridors shall be maintained as approved in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	1020.1 Maintenance. Corridors shall be maintained as approved and in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	This limitation is so that occupants from all tenant spaces will be maintained in accordance with the applicable building code. This limitation is based on one of the fundamental principles of egress: to provide a means of egress where all occupants are capable of being used by occupants without keys, tools, special knowledge or special effort
233	CAAM	1020.1.1 Hoistway openings. Elevator hoistway openings shall be maintained as approved in accordance with the applicable building code.	1020.1.1 Hoistway openings. Elevator hoistway openings shall be maintained as approved and in accordance with the applicable building code.	Add a sentence to indicate that any fire-resistance rated construction must be maintained in accordance with Chapter 7.
234	CAAM	1020.4 Dead ends. Where more than one exit or exit access doorway is required by the applicable building code, the exit access, including any dead end conditions, shall be maintained as approved in accordance with the applicable building code.	1020.4 Dead ends. Where more than one exit or exit access doorway is required, the exit access, including any dead end conditions, shall be maintained as approved and in accordance with the applicable building code.	This section was not shown as deleted but needed to be converted to a maintenance function.
235	CAAM	1020.5.1 Corridor ceiling. When the space between the corridor ceiling and the floor or roof structure above is used as a return air plenum, the space and any contents shall be maintained as approved in accordance with the applicable building code.	1020.5.1 Corridor ceiling. When the space between the corridor ceiling and the floor or roof structure above is used as a return air plenum, the space and any contents shall be in accordance with the applicable building code.	Revised to maintenance language.
236	CAAM	1021.3 Openness. The required openness of egress balconies shall be maintained as approved in accordance with the applicable building code.	1021.3 Openness. The required openness of egress balconies shall be maintained in accordance with the applicable building code.	Revised to maintenance language.
237	CAAM	1023.2 Maintenance. Enclosures for interior exit stairways and ramps shall be maintained as approved in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	1023.2 Maintenance. Enclosures for interior exit stairways and ramps shall be maintained in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	Operational requirement and revised to maintenance language.
238	CAAM	1023.3 Termination. Interior exit stairways and ramps shall terminate as approved in accordance with the applicable building code.	1023.3 Termination. Interior exit stairways and ramps shall terminate as approved and in accordance with the applicable building code.	Revised to note that a fire resistance rating may be required for interior exit stairways. Also adds a sentence regarding maintenance of the same.
239	CAAM	1023.3.1 Connections. Where interior exit stairways and ramps connect to an exit discharge or a public way by an exit passageway, the interior exit stairway and ramp shall be maintained as approved in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	1023.3.1 Connections. Where interior exit stairways and ramps connect to an exit discharge or a public way by an exit passageway, the interior exit stairway and ramp shall be maintained as approved and in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	Revised to maintenance language to prohibit modification of the stairway termination.
240	CAAM	1023.5 Penetrations. Penetrations into or through interior exit stairways shall be maintained as approved in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	1023.5 Penetrations. Penetrations into or through interior exit stairways shall be maintained as approved and in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	Revised to note that a fire resistance rating may be required for connections between fire rated stairways and the exit discharge or public way. Also adds a sentence regarding maintenance of the same.
241	CAAM	1023.6 Ventilation. Equipment and ductwork for interior exit stairway and ramp ventilation shall be maintained as approved and remain operational in accordance with the applicable building code.	1023.6 Ventilation. Equipment and ductwork for interior exit stairway and ramp ventilation shall be maintained and remain operational in accordance with the applicable building code.	Revised to maintenance language.
242	CAAM	1023.8 Discharge identification. Where the applicable building code requires a barrier to prevent persons from unintentionally continuing into levels below the level of exit discharge for an interior exit stairway or ramp, the barrier shall be maintained as approved in accordance with the applicable building code. Directional exit signs shall be maintained in accordance with the applicable building code.	1023.8 Discharge identification. An interior exit stairway and ramp shall not continue below its level of exit discharge unless an approved barrier is maintained at the level of exit discharge to prevent persons from unintentionally continuing into levels below. Directional exit signs shall be maintained in accordance with the applicable building code.	Operational and maintenance language for ventilation of exit stairs.
243	CAAM	1023.11.2 Enclosure access. Access to the stairway or ramp within a smokeproof enclosure shall be maintained as approved in accordance with the applicable building code.	1023.11.2 Enclosure access. Access to the stairway or ramp within a smokeproof enclosure shall be maintained as approved and in accordance with the applicable building code.	Operation, maintenance and signage requirements for appropriate egress delineation. So that building occupants using an exit stairway during an emergency situation will be prevented from going past the level of exit discharge, the run of the stairway is to be interrupted by a partition, door, gate or other approved means. These devices help users of the stairway to recognize when they have reached the point that is the level of exit discharge.
244	CA		1023.12 Standpipes. Standpipe and standpipe hose connections in smokeproof enclosures shall be maintained in accordance with Chapter 9.	Enclosure access to smokeproof enclosures is critical to the successful function of the smokeproof enclosure. This section notes that there may be special requirements in the applicable building code for access into a smokeproof enclosure.
245	CAAM	1024.3 Maintenance. Exit passageway enclosures shall be maintained as approved in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	1024.3 Maintenance. The construction of exit passageway enclosures shall be maintained in accordance with the applicable building code. Fire-resistance rated construction shall be maintained in accordance with Chapter 7.	Note to maintain standpipes in smokeproof enclosures with direction back to Chapter 9.
246	CAAM	1024.4 Termination. The termination of exit passageways shall be maintained as approved in accordance with the applicable building code.	1024.4 Termination. Unless otherwise required by the applicable building code, exit passageways on the level of exit discharge shall be maintained to terminate at an exit discharge and exit passageways on other levels shall be maintained to terminate at an exit.	Revised to maintenance language. Added a sentence directing back to Chapter 7 for fire resistance rate construction.
247	CAAM	1025.2.5 Obstacles. Where the applicable building code requires luminous egress path markings of obstacles projecting into the egress path, the markings shall be maintained as approved in accordance with the applicable building code.	1025.2.5 Obstacles. Luminous egress path markings of obstacles at or below 6 feet 6 inches (1981 mm) in height and projecting more than 4 inches (102 mm) into the egress path shall be maintained in accordance with the applicable building code.	Revised to maintenance language for termination of exit passageways. This section is consistent with the exit continuity and enclosure requirements in Section 1023.3. The intent of this section is to provide safety in all portions of the exit by requiring continuity of the fire protection characteristics of the enclosure for the exit by requiring continuity with an exit passageway. This would include, but not be limited to, the fire resistance rating of the enclosure walls for the exit stairways and the opening protection rating of the doors.
248	CAAM	1025.2.6 Doors within the exit path. Luminous egress path markings of doors through which occupants must pass in order to complete the exit path shall be maintained as approved in accordance with the applicable building code.	1025.2.6 Doors within the exit path. Luminous egress path markings of doors through which occupants must pass in order to complete the exit path shall be maintained in accordance with the applicable building code.	Revised to maintenance language.
249	CAAM	1027.2 Use in a means of egress. Exterior exit stairways and ramps approved as an element of a required means of egress in accordance with the applicable building code shall be maintained.	1027.2 Use in a means of egress. Unless otherwise permitted by the applicable building code, exterior exit stairways shall not be used as an element of a required means of egress for Group I-2 occupancies. For occupancies in other than Group I-2, exterior exit stairways and ramps shall be maintained as an element of a required means of egress in accordance with the applicable building code.	Revised to maintenance language for luminous egress path markings.
250	CAAM	1027.3 Open side. Required open side area for exterior exit stairways and ramps serving as an element of a required means of egress shall be maintained as approved in accordance with the applicable building code.	1027.3 Open side. Required open side area for exterior exit stairways and ramps serving as an element of a required means of egress shall be maintained in accordance with the applicable building code.	Notes that exterior exit stairways are not typically approved for Group I-2 facilities.
251	CAAM	1027.4 Side yards. The open areas adjoining exterior exit stairways or ramps required by the applicable building code to be yards, courts or public ways shall be maintained as approved in accordance with the applicable building code.	1027.4 Side yards. The open areas adjoining exterior exit stairways or ramps shall be maintained as yards, courts or public ways unless otherwise approved in accordance with the applicable building code.	Revises regulations for all other occupancies to maintenance language in accordance with the applicable building code. Exterior exit stairways are typically not permitted for Group I-2 since quick evacuation of nonambulatory patients from buildings using exterior stairways is impractical. Some patients may not be capable of self-preservation and, therefore, may require assistance from staff. The period of evacuation of nonambulatory patients could become lengthy, especially in bad weather conditions.
252	CAAM	1027.5 Location. The minimum fire separation distance from the exterior edge of the stairway or ramps, including landings, for exterior exit stairways and ramps shall be maintained as approved in accordance with the applicable building code.	1027.5 Location. The minimum fire separation distance from the exterior edge of the stairway or ramps, including landings, for exterior exit stairways and ramps shall be maintained as approved and in accordance with the applicable building code.	Operational requirement for maintenance of required yards, courts and public ways.
253	CAAM	1027.6 Exterior exit stairway and ramp protection. Separation or fire-resistance rated protection of exterior exit stairways and ramps from the interior of the building shall be maintained as approved in accordance with the applicable building code.	1027.6 Exterior exit stairway and ramp protection. Separation or fire-resistance rated protection of exterior exit stairways and ramps from the interior of the building shall be maintained in accordance with the applicable building code.	Revised to maintenance language for maintaining the fire resistance separation distance in accordance with the applicable building code.
254	CAAM	1028.4.2 Egress court protection. Separation or fire-resistance rated construction required by the applicable building code for an egress court serving a building or portion thereof shall be maintained as approved in accordance with the applicable building code.	1028.4.2 Egress court protection. Where required by the applicable building code, an egress court serving a building or portion thereof shall maintain separation or fire-resistance rated in accordance with the applicable building code.	Revised to maintenance language for fire resistance rated protection or separation for exterior exit stairs and the interior of a building.
255	CAAM	1029.1.1 Bleachers. Bleachers, grandstands and folding and telescopic seating shall be maintained in accordance with the applicable building code.	1029.1.1 Bleachers. Bleachers, grandstands and folding and telescopic seating, that are not building elements and regulated by the building code, shall be maintained to comply with ICC 300.	Revised to maintenance language for maintaining the fire resistance separation distance in accordance with the applicable building code.
256	CAAM	1029.1.1.1 Spaces under grandstands and bleachers. Fire-resistance rated construction for spaces under grandstands and bleacher shall be maintained in accordance with Chapter 7.	1029.1.1.1 Spaces under grandstands and bleachers. Where spaces under grandstands or bleachers are used, fire-resistance rated construction shall be maintained in accordance with Chapter 7.	Restored requirement of all bleachers not regulated by the building code (portable, outdoor) to still comply with ICC 300.
257	CA		1029.4 Foyers and lobbies. In Group A-1 occupancies, where persons are admitted to the building at times when seats are not available, such persons shall be allowed to wait in a lobby or similar space, provided such lobby or similar space shall not encroach upon the minimum width or required capacity of the means of egress. Such foyer, if not directly connected to a public street by all the main entrances or exits, shall be maintained with a straight and unobstructed path of travel to every such main entrance or exit in accordance with the applicable building code.	Operational requirements for crowd control in A-1 occupancies. In theaters, people may arrive and wait for the next show while another group has yet to exit. This is extremely common in multiplex theater complexes. In every case, the main entrance (exit) and all other exits are to be constantly available for the entire building occupant load.
258	CAAM	1029.7 Travel distance. The exit access travel distance shall be maintained as approved in accordance with the applicable building code.	1029.7 Travel distance. The exit access travel distance shall be maintained in accordance with Section 1017 and the applicable building code. Where aisles are provided for seating, the distance shall be measured along the aisles and aisle accessways without travel over or on the seats.	For example, because of the queuing of large crowds, particularly in theaters where a performance may be in progress and people must wait to attend the next one, standing space is often provided. For reasons of safety, such spaces cannot be located in or interfere with established paths of egress from the assembly areas. While a facility may choose to separate the route for means of egress using partitions or railings from the general lobby space to allow for easy traffic flow through the lobby to the street, it is not required to designate these areas.
259	CAAM	1029.8 Common path of egress travel. The common path of egress travel shall be maintained as approved in accordance with the applicable building code.	1029.8 Common path of egress travel. Unless otherwise required by the applicable building code, the common path of egress travel shall be maintained to not exceed 30 feet (9144 mm) from any seat to a point where an occupant has a choice of two paths of egress travel to two exits. Exceptions: 1. For areas serving less than 50 occupants, the common path of egress travel shall not exceed 75 feet (22 860 mm). 2. For smoke-protected or open-air assembly seating, the common path of egress travel shall not exceed 50 feet (15 240 mm).	Revised to maintenance language for travel distance within flexible or changing assembly operations.
				Restores guidance for unsecured seating arrangements. The maximum travel distance down a single aisle accessway between rows of seating to a location where a patron would have two choices for a way out of the space is 30 feet (9144 mm). In smoke-protected or open-air seating, the common path of egress travel can be up to 50 feet (15 240 mm).  If the room or space (e.g., press box, box, gallery or balcony) has less than 50 occupants, the travel distance can be increased to 75 feet (22 860 mm). This would allow for a path of travel from a box seat, out of the box and to a main aisle or even a corridor located outside the assembly room itself.

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250	CAAM	1029.8.1 Path through adjacent row. Paths through adjacent rows shall be maintained as approved in accordance with the applicable building code.	1029.8.1 Path through adjacent row. Unless otherwise required by the applicable building code, where one of the two paths of travel is across the aisle through a row of seats to another aisle, there shall be not more than 24 seats between the two aisles, and the minimum clear width between rows for the row between the two aisles shall be 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row between aisles. Exception: For smoke-protected or open-air assembly seating there shall be not more than 40 seats between the two aisles and the minimum clear width shall be 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat.	Restores guidance for unsecured seating arrangements. In establishing the point where the occupants of a row served by a single access aisle (e.g., seating section against a wall or barrier on one end of the aisle accessway) will have two distinct paths of travel, the code allows one of those paths to be through the rows of an adjacent seating area or section (e.g., seating section with aisles on both ends of the aisle accessways). This requirement increases the row widths for the single-access seating section and the adjacent dual-access seating section. This allows the occupants to either travel down the single access aisle or readily traverse the oversized row widths to gain access to a second aisle. This exception allows a greater number of seats spaced with a minimum clearance of 12 inches (305 mm) for smoke-protected or open-air assembly seating.
251	CAAM	1029.9 Assembly aisles. Aisles leading to exits for every occupied portion of any building, room or space used for assembly purposes that contains seats, tables, displays, similar fixtures or equipment shall be maintained as approved in accordance with the applicable building code.	1029.9 Assembly aisles are required. Every occupied portion of any building, room or space used for assembly purposes that contains seats, tables, displays, similar fixtures or equipment shall maintain aisles leading to exits or exit access doorways in accordance with this section.	Revised to maintenance language for unsecured seating, tables, and assembly spaces.
252	CAAM	1029.9.2 Aisle catchment area. Aisle capacity and catchment areas shall be maintained as approved in accordance with the applicable building code.	1029.9.2 The aisle shall maintain sufficient capacity for the number of persons accommodated by the catchment area served by the aisle. The catchment area served by an aisle is that portion of the total space served by that section of the aisle. Catchment areas, shall maintain balanced use of all means of egress, with the number of persons in proportion to egress capacity unless otherwise required by the applicable building code.	Important operational requirements for maintaining the catchment area.
253	CAAM	1029.9.3 Converging aisles. Where aisles converge to form a single path of egress travel, the required capacity of that path shall be maintained to not less than that approved in accordance with the applicable building code.	1029.9.3 Converging aisles. Where aisles converge to form a single path of egress travel, the required capacity of that path shall be maintained to not less than the combined required capacity of the converging aisles.	Revised to maintenance language for converging aisles.
254	CAAM	1029.9.4 Uniform width and capacity. Where required by the applicable building code for aisles where egress is possible in either of two directions, uniform width and required capacity shall be maintained.	1029.9.4 Uniform width and capacity. Those portions of aisles, where egress is possible in either of two directions, shall remain unobstructed to a cross aisle, foyer, doorway, vomitory, concourse or stairway having access to an exit. Exception: 1. Dead-end aisles shall be not greater than 20 feet (6096 mm) in length. 2. Dead-end aisles longer than 16 rows are permitted where seats beyond the 16th row dead-end aisle are not more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row. 3. For smoke-protected or open-air assembly seating, the dead-end aisle length of vertical aisles shall not exceed a distance of 21 rows. 4. For smoke-protected or open-air assembly seating, a longer dead-end aisle is permitted where seats beyond the 21-row dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.	Revised to maintenance language and notes that uniform width and capacity just be maintained in assembly areas.
255	CAAM	1029.9.5 Dead-end aisles. Dead-end aisles shall be maintained as approved by the applicable building code. Each end of an aisle shall remain unobstructed to a cross aisle, foyer, doorway, vomitory, concourse or stairway having access to an exit where required by the applicable building code.	1029.9.5 Dead-end aisles. Unless otherwise required by the applicable building code, each end of an aisle shall remain unobstructed to a cross aisle, foyer, doorway, vomitory, concourse or stairway having access to an exit. Exception: 1. Dead-end aisles shall be not greater than 20 feet (6096 mm) in length. 2. Dead-end aisles longer than 16 rows are permitted where seats beyond the 16th row dead-end aisle are not more than 24 seats from another aisle, measured along a row of seats having a minimum clear width of 12 inches (305 mm) plus 0.6 inch (15.2 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row. 3. For smoke-protected or open-air assembly seating, the dead-end aisle length of vertical aisles shall not exceed a distance of 21 rows. 4. For smoke-protected or open-air assembly seating, a longer dead-end aisle is permitted where seats beyond the 21-row dead-end aisle are not more than 40 seats from another aisle, measured along a row of seats having an aisle accessway with a minimum clear width of 12 inches (305 mm) plus 0.3 inch (7.6 mm) for each additional seat above seven in the row where seats have backrests or beyond 10 where seats are without backrests in the row.	Restores important references for unsecured seating requirements and dead-end aisles. Both ends of a cross aisle must terminate at either an intersecting aisle, a foyer, a doorway or a vomitory (lane) that gives access to an exit(s). Each exception allows an aisle to have a dead end of limited length. Exceptions 1 and 2 address dead-end aisles in assembly spaces with or without smoke protection. Exceptions 3 and 4 address dead-end aisles only in smoke-protected or open-air assembly seating. In accordance with Exception 1, dead-end aisles (similar to corridors and passageways) that terminate at one end of a cross aisle or at a foyer, doorway or vomitory must not be greater than 20 feet (6096 mm) in length. The intent of the row width requirements in the exceptions is to provide sufficient clear width between rows of seating to allow the occupants to pass quickly from a dead-end aisle to the aisle at the opposite end in times of emergency.
256	CAAM	1029.9.6 Aisle measurement. The clear width for aisles shall be measured in accordance with the applicable building code.	1029.9.6 Aisle measurement. The clear width for aisles shall be measured to walls, edges of seating and tread edges except for permitted projections. Exception: The clear width of aisles adjacent to seating at tables shall be permitted to be measured in accordance with Section 1029.13.1 and the applicable building code.	Provides operational guidance for measurement of clear width.
257	CAAM	1029.10.3 Transition marking. Distinctive marking stripes at each nosing or leading edge adjacent to the transition shall be maintained as approved in accordance with the applicable building code.	1029.10.3 Transition marking. Where required by the applicable building code, a distinctive marking stripe shall be maintained at each nosing or leading edge adjacent to the transition. The edge marking stripe shall be distinctively different from the stepped aisle contrasting marking stripe.	At these transitions there may be a change in riser height, even if the tread depth stays the same. The stripe is to draw attention to the transition to reduce the chance of a trip or fall. This is different from the stripes required for stepped aisles
258	CAAM	1029.12.1 Walking surface. Surface of aisles, stepped aisles and ramped aisles required by the applicable building code to be of slip-resistant materials that are securely attached shall be maintained.	1029.12.1 Walking surface. Where required by the applicable building code, the surface of aisles, stepped aisles and ramped aisles shall be maintained of slip-resistant materials that are securely attached.	Revised to a maintenance requirement for walking surfaces to be slip resistant.
259	CAAM	1029.12.2 Outdoor conditions. Outdoor aisles, stepped aisles and ramped aisles and outdoor approaches to aisles, stepped aisles and ramped aisles required by the applicable building code to be designed to prevent the accumulation of water shall be maintained as approved so that water will not accumulate on the walking surface. Outdoor aisles, stepped aisles and ramped aisles and outdoor approaches to aisles, stepped aisles and ramped aisles not regulated by the USBC shall be maintained so that water will not accumulate on the walking surface.	1029.12.2 Outdoor conditions. Outdoor aisles, stepped aisles and ramped aisles and outdoor approaches to aisles, stepped aisles and ramped aisles shall be maintained so that water will not accumulate on the walking surface.	Important operational requirements for maintaining outdoor aisles, steps, etc.
260	CAAM	1029.13 Aisle accessways. Aisle accessways for seating at tables and seating in rows shall be maintained as approved in accordance with the applicable building code.	1029.13 Aisle accessways. Aisle accessways for unsecured seating and tables shall comply with 1029.13.1 and the applicable building code. Aisle accessways for unsecured seating in rows shall comply with Section 1029.13.2 and the applicable building code.	Scoping language only.
271	CAAM	1029.15 Seat stability. Where the applicable building code requires seats to be securely fastened to the floor or in groups, in a building, room or space used for assembly purposes, seats shall be arranged and maintained as approved in accordance with the applicable building code.	1029.15 Seat stability. In a building, room or space used for assembly purposes, the seats shall be securely fastened to the floor unless otherwise required by the applicable building code. Exception: 1. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with 200 or fewer seats, the seats shall not be required to be fastened to the floor. 2. In a building, room or space used for assembly purposes or portions thereof with seating at tables and without ramped or tiered floors for seating, the seats shall not be required to be fastened to the floor. 3. In a building, room or space used for assembly purposes or portions thereof without ramped or tiered floors for seating and with greater than 200 seats, the seats shall be fastened together in groups of not less than three or the seats shall be securely fastened to the floor. 4. In a building, room or space used for assembly purposes where flexibility of the seating arrangement is an integral part of the design and function of the space and seating is on tiered levels, not more than 200 seats shall not be required to be fastened to the floor. Plans showing seating, tiers and aisles shall be submitted for approval. 5. Groups of seats within a building, room or space used for assembly purposes separated from other seating by railings, guards, partial height walls or similar barriers with level floors and having not more than 14 seats per group shall not be required to be fastened to the floor. 6. Seats intended for musicians or other performers and separated by railings, guards, partial height walls or similar barriers shall not be required to be fastened to the floor.	Restores a critical requirement for the stability of unsecured seating areas. The purpose of this section is to require that assembly seating be fastened to the floor where it would be a significant hazard if loose and subject to tipping over. The exceptions allow loose assembly seating for situations where the hazard is lower, such as floors where ramped or tiered seating is not used; where not more than 200 seats are used; for box seating arrangements; and where a limited number of seats are within railings, guards or partial height walls.
272	CAAM	1029.17 Assembly guards. Guards required by the applicable building code adjacent to seating in a building, room or space used for assembly purposes shall be maintained as approved in accordance with the applicable building code.	1029.17 Assembly guards. Guards adjacent to seating in a building, room or space used for assembly purposes shall be maintained in accordance with the applicable building code. All bleachers, grandstands and folding and telescopic seating not regulated by the building code, guards must be maintained where required by ICC 300 and Section 1029.17.1.	Restored requirement of maintaining guards in assembly areas. All bleachers not regulated by the building code (portable, outdoor) to still comply with ICC 300.
273	CA	1030.2 Minimum size. Emergency escape and rescue openings shall be maintained to provide the minimum net clear opening area, height and width in accordance with the applicable building code when normally opened.	1030.1 General. Emergency escape and rescue openings of a building, including those in R-2, R-3, R-4 and R-5 occupancies, shall be maintained in accordance with the applicable building code.	Revised to maintenance language for emergency escape and rescue openings.
274	CAAM	1030.3 Maximum height from floor. Emergency escape and rescue opening height from the floor, as measured in accordance with the applicable building code, shall be maintained.	1030.2 Minimum size. Emergency escape and rescue openings shall be maintained to provide the minimum opening area, height and width in accordance with the applicable building code. The net clear opening dimensions shall be the result of normal operation for the opening.	Restores technical language to ensure the minimum opening is available for each emergency escape and rescue opening.
275	CAAM	1030.3 Maximum height from floor. Emergency escape and rescue opening height from the floor, as measured in accordance with the applicable building code, shall be maintained.	1030.3 Maximum height from floor. Emergency escape and rescue opening height, as measured from the bottom of the clear opening to the floor, shall be maintained in accordance with the applicable building code.	Restores technical language to ensure the height from floor for each emergency escape opening.
276	CA	1030.4 Window wells. An emergency escape and rescue opening and associated window well shall be maintained in accordance with the applicable building code. Emergency escape and rescue openings shall remain able to be fully opened. Ladders or steps shall not be obstructed by the emergency escape and rescue opening or other objects.	1030.4 Window wells. An emergency escape and rescue opening and associated window well shall be maintained in accordance with the applicable building code. Emergency escape and rescue openings shall remain able to be fully opened. Ladders or steps shall not be obstructed by the emergency escape and rescue opening or other objects.	Operational and maintenance requirements for emergency escape openings. Combines requirements from other portions of this section regarding requirements associated with window wells.
277	CA	1030.5 Bars, grilles, covers and screens. Bars, grilles, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided that the minimum net clear opening size complies with the applicable building code and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.	1030.5 Bars, grilles, covers and screens. Bars, grilles, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided that the minimum net clear opening size complies with the applicable building code and such devices shall be releasable or removable from the inside without the use of a key, tool or force greater than that which is required for normal operation of the emergency escape and rescue opening.	Revised to maintenance language regarding the placement of bars, grilles and screens associated with emergency escape openings.
278	CAAM	1031.4 Exit signs. Exit signs shall be maintained in accordance with Sections 1013, 1203 and the applicable building code. Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the exit shall not be allowed.	1031.4 Exit signs. Exit signs shall be installed and maintained in accordance with Sections 1013, 1203 and the applicable building code. Decorations, furnishings, equipment or adjacent signage that impairs the visibility of exit signs, creates confusion or prevents identification of the exit shall not be allowed.	Revises reference to Chapter 12 for maintenance of exit signs.
279	CA	1031.9 Floor identification signs. The floor identification signs shall be maintained in accordance with Section 1023.9 and the applicable building code.	1031.9 Floor identification signs. The floor identification signs shall be maintained in accordance with Section 1023.9 and the applicable building code.	Revises the requirement to maintenance and signs only.
281	CA	1031.12 Area of refuge. Areas of refuge shall be maintained in accordance with Section 1009.6, 1031.8 and the applicable building code. Designated areas shall be free of obstructions at all times and any required signs, instructions or equipment shall be maintained.	1031.12 Area of refuge. Areas of refuge shall be maintained in accordance with Section 1009.6, 1031.8 and the applicable building code. Designated areas shall be free of obstructions at all times and any required signs, instructions or equipment shall be maintained.	New section for the maintenance of areas of refuge.
282	CA	1031.13 Door opening force. The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed the maximum force permitted by the applicable building code. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.	1031.13 Door opening force. The force for pushing or pulling open interior swinging egress doors, other than fire doors, shall not exceed the maximum force permitted by the applicable building code. These forces do not apply to the force required to retract latch bolts or disengage other devices that hold the door in a closed position.	New section for the maintaining the door opening force.
286	CA	3801.1 Scope. Higher education laboratories and laboratory suites complying with the requirements of this chapter and the applicable building code shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas without requiring classification as a Group H occupancy.	3801.1 Scope. Higher education laboratories and laboratory suites complying with the requirements of this chapter and the applicable building code shall be permitted to exceed the maximum allowable quantities of hazardous materials in control areas without requiring classification as a Group H occupancy.	Changes IBC to applicable building code and removes reference to Chapter 50 for the maximum allowable quantities.
287	CA	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 the provisions in Chapters 50 through 67 and the applicable building code for quantities not exceeding the maximum allowable quantity.	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 the provisions in Chapters 50 through 67 and the applicable building code for quantities not exceeding the maximum allowable quantity.	Higher education facilities still must comply with all other requirements of Chapters 50 through 67 except as modified by this chapter or the applicable building code. Essentially, this chapter provides more flexibility with amounts of materials; however, all other provisions in the hazardous materials chapters where the MAQs are not exceeded must be addressed, such as requirements for incompatible materials, signage, release of materials and a variety of other operational requirements.
289	CA	3803.1 Scope. Higher education laboratories and laboratory suites shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.	3803.1 Scope. Higher education laboratories and laboratory suites shall be in accordance with the general safety provisions in Sections 3803.1.1 through 3803.2.2.	Scoping language. These general requirements apply to any facility using any of the sections in Chapter 38

	C	E	F	G
699	CA		3803.1.7 Automatic fire-extinguishing systems. Where provided, an automatic sprinkler system shall be maintained in accordance with Chapter 9.	Removes construction language and revises this section with reference to Chapter 9 for maintenance of fire protection systems. In order to use the provisions of Chapter 38 in any laboratory, the entire building shall be equipped with an approved automatic sprinkler system in accordance with the applicable building code. This is a significant increase in protection from typical B-occupancy laboratories, which can be built under Chapter 50 without sprinklers. Chapter 38 does have limited provisions to allow for existing laboratories in existing buildings to utilize some allowances.
700	CA		3803.2.1 Container size. The maximum container size for all hazardous materials shall be 5.3 gallons (20 L) for liquids, 50 pounds (22.7 kg) for solids, 100 cubic feet (2.83 m3) for health-hazard gases per the applicable building code and 500 cubic feet (14.15 m3) for all other gases in accordance with the applicable building code.  Exception: Hazardous waste collection containers, for other than Class I flammable liquids and Class II combustible liquids, are permitted to exceed 5.3 gallons (20 L) where approved.	Changes reference to Table 5003.1.1(1) and Table 5003.1.1(2) to "applicable building code"
701	CA		3804.1 General. Where laboratory suites are provided, they shall be constructed in accordance with the applicable building code and approved by the Building Official.	This section provides the concept of laboratory suites that, when approved by the building official, can be used as an alternative to the general control area concept. The concept is similar to those used for control areas. 2018 VCC Section 428 also contains these detailed requirements for laboratory suites. Laboratory suites provide a much higher level of fire and hazardous materials protection than the traditional control area design described in previous building codes. Besides the additional operational requirements found in Section 3803, laboratory suites are required by the VCC to have:  -Rated fire barriers for compartmentation of laboratory suites within buildings. -Standby or emergency power for safety-related equipment and enhanced automatic sprinkler protection in laboratories above the sixth story or in a story below grade plane. -Automatic sprinkler design and density exceeding that which would be required by NFPA 45.
702	CA		3804.1.1 Laboratory suites. The number of laboratory suites and percentage of maximum allowable quantities of hazardous materials in laboratory suites shall be in accordance with the applicable building code.	Removed construction related maximum allowable quantities and references the applicable building code.
703	CA		Delete TABLE 3804.1.1 DESIGN AND NUMBER OF LABORATORY SUITES PER FLOOR	Removed construction related quantities and references the applicable building code.
704	CA		3804.1.1.1 Separation from other non-laboratory areas. Laboratory suites shall maintain separation from other portions of the building in accordance with Chapter 7 and the applicable building code.	Revised language to reference the applicable building code and Chapter 7 for maintenance of fire resistance rated barriers.
705	CA		3804.1.1.2 Separation from other laboratory suites. Laboratory suites shall be separated from other laboratory suites in accordance with Chapter 7 and the applicable building code.	Revised language to reference the applicable building code and Chapter 7 for maintenance of fire resistance rated barriers.
706	CA		Delete 3804.1.1.3 Floor assembly fire-resistance	Construction requirement
707	CA		3804.1.1.4 Maximum number. The maximum number of laboratory suites shall be in accordance with the applicable building code. 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 the applicable building code.	Removed construction related quantities and references the applicable building code. Changes reference to Table 3804.1.1 to applicable building code.
708	CAAM	3804.1.1.6 Standby or emergency power. Emergency or standby power for higher education laboratory suites shall be maintained in accordance with Section 1203.2.13.	3804.1.1.6 Standby or emergency power. Higher education laboratory suites with emergency or standby power shall be maintained in accordance with Section 1203.2.13.	Removed construction language and revised with maintenance and operations requirements.
709	CA		3804.1.1.7 Ventilation. Ventilation shall be maintained in accordance with Chapter 7 of NFPA 45, and the applicable building code.	Removed construction language and revised with maintenance and operations requirements. Adds the word maintained and changes IMC to applicable building code.
710	CA		3804.1.1.8 Liquid-tight floor. Portions of laboratory suites where hazardous materials are present shall be maintained with a liquid-tight floor in accordance with the applicable building code.	Removed construction language and revised with maintenance and operations requirements.
711	CA		3804.1.1.9 Automatic fire-extinguishing systems. Buildings containing laboratory suites shall be maintained throughout with an approved automatic sprinkler system in accordance with Chapter 9.	Removed construction language and revised with maintenance and operations requirements.
712	CA		3804.1.2 Percentage of maximum allowable quantity in each laboratory suite. The percentage of maximum allowable quantities of hazardous materials in each laboratory suite shall be in accordance with the applicable building code.	Removed construction related maximum allowable quantities and references the applicable building code.
713	CA		3805.1 Scope. Storage and use of hazardous materials in existing higher education laboratories located within existing buildings not equipped throughout with an automatic sprinkler system is permitted where such use complies with the applicable building code, Section 3803, Chapters 50 through 67, as applicable, and Sections 3805.2 through 3805.4.	Scoping language only. Not construction requirements. Changes "Section 903.3.1.1" to "NFPA 13 Standard" and adds applicable building code.
714	CA		3805.2 Nonsprinklered laboratories. The maximum allowable quantities of hazardous materials in storage and use in control areas in higher education laboratories located in buildings not equipped throughout with an automatic sprinkler system in accordance with the applicable NFPA 13 standard, shall be in accordance with the applicable building code and Sections 3805.2.1 and 3805.2.2.	Removed construction related maximum allowable quantities and references the applicable building code and the restricted material storage listed below. Changes "Section 903.3.1.1" to "NFPA 13 Standard"
715	CA		3805.2.1 Restricted materials storage. Where approved in accordance with the applicable building code, storage of the following hazardous materials in buildings not equipped throughout with an automatic sprinkler system to the applicable NFPA 13 standard are allowed within a higher education laboratory control area where maintained in accordance with this section: 1. Pyrophorics. 2. Class 4 Oxidizers. Additional quantity increases shall be prohibited, and such materials shall be stored in accordance with all of the following: 1. Containers shall be completely sealed and stored in accordance with the manufacturers' recommendations. 2. Storage shall be within approved hazardous material 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 7.1.1. 3. The storage cabinet or glove box shall not contain any storage of incompatible materials.	Changes to reference the applicable building code, the applicable NFPA 13 standard and to remove quantity adjustments from the SFPC. Keeps important operational and maintenance requirements. Pyrophorics and Class 4 Oxidizers are particularly dangerous products and this section provides specific guidance for the operation and maintenance when storing these products. This section indicates limited storage of pyrophorics or Class 4 oxidizers in nonsprinklered laboratories when approved by the applicable building code and all of the prescribed conditions are met. These hazardous materials have caused many university laboratories difficulty regarding code compliance. The amounts needed for experimentation are typically very limited.
716	CA		3805.2.2 Restricted materials use. Where approved by the applicable building code, the use of the following hazardous materials in buildings not equipped throughout with an automatic sprinkler system in accordance with the applicable NFPA 13 standard, shall be allowed within a higher education laboratory control area where maintained in accordance with this section: 1. Pyrophorics. 2. Class 4 Oxidizers. Additional quantity increases shall be prohibited, and such materials shall only be used in accordance with all of the following: 1. Use shall be within an approved chemical fume hood listed in accordance with UL 1805, or in an inert atmosphere glove box in accordance with NFPA 45, Section 7.1.1, or other approved equipment designed for the specific hazard of the material. 2. Combustible materials shall be kept not less than 2 feet (610 mm) 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 (6096 mm) of the use in accordance with Section 906.	Changes to reference the applicable building code, the applicable NFPA 13 standard and to remove quantity adjustments. Keeps important operational and maintenance requirements. Pyrophorics and Class 4 Oxidizers are particularly dangerous products and this section provides specific guidance for the operation and maintenance when using these products. Where approved by a fire code official, this section allows limited use of pyrophorics or Class 4 oxidizers in nonsprinklered laboratories when all of the prescribed conditions are met. As discussed in Section 3805.2.1, the amounts necessary for experimentation in the laboratories are very limited. But, without these two sections, those materials would not be permitted in any amount.
717	CA		3805.3 Restricted materials automatic fire detection. Where provided in higher education laboratories in nonsprinklered buildings, an automatic fire detection system shall be maintained in accordance with Chapter 9.	Removes construction language and revises this section with reference to Chapter 9 for maintenance of fire protection systems.
718	CA		3805.3.1 System supervision and monitoring. Where required or provided, 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.	Removes construction language and revises this section to maintenance language. Added "where required or provided"
719	CA		3805.4 Percentage of maximum allowable quantity per control area. The percentage of maximum allowable quantities per control area of hazardous materials in higher education laboratories in existing nonsprinklered buildings shall be permitted to be increased only in accordance with the applicable building code and approval from the Building Official.	Revised language to make it clear that increases in quantities must be approved by the building official. Changed the reference to Table 3805.4 to the applicable building code.
720	CA		Delete TABLE 3805.4 DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING NONSPRINKLERED LABORATORIES	Construction requirements
721	CA		3806.1 Scope. Storage and use of hazardous materials in existing higher education laboratories within buildings equipped throughout with an automatic sprinkler system in accordance with the applicable NFPA 13 standard shall be in accordance with Section 3803 and with Chapters 50 through 67, as applicable, except as modified by this section.	Scoping language only. Changed 903.3.1.1 to applicable NFPA 13 standard
722	CA		3806.2 Hazardous materials storage and use. Storage and use of hazardous materials within control areas in higher education laboratories equipped with an automatic sprinkler system shall be in accordance with this section and Chapters 50 through 67, as applicable.  Exception: Existing laboratories in buildings equipped throughout with an automatic sprinkler constructed and approved as laboratory suites in accordance the applicable building code are permitted to comply with Section 3804.	Changed new construction reference to the defined term "laboratory suites" and the applicable building code. Provides direction as to what operations and maintenance requirements apply to existing sprinklered laboratories in higher education. Since construction language has been removed, what remains are maintenance and operation requirements for all laboratories and laboratory suites.
723	CA		3806.2.1 Percentage of maximum allowable quantities per control area. The percentage of maximum allowable quantities per control area of hazardous materials in higher education laboratories equipped with an automatic sprinkler system shall be in accordance with the applicable building code.	Removed construction related maximum allowable quantities and references the applicable building code. Changed Table 3806.2.1 reference to applicable building code.
724	CAAM		Delete TABLE 3806.2.1 DESIGN AND NUMBER OF CONTROL AREAS IN EXISTING SPRINKLERED LABORATORIES	Construction requirements.



# **FP5003.1.1(1)-18**

**Proponents:** Julius Ballanco (JBENGINEER@aol.com)

## **2018 International Fire Code**

**Revise as follows:**

**TABLE 5003.1.1(1)**

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, j, m, n, p</sup>

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE <sup>b</sup>			USE-CLOSED SYSTEMS <sup>b</sup>			USE-OPEN SYSTEMS <sup>b</sup>				
			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 <sup>q</sup>	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA			
	Baled <sup>o</sup>		(1,000)			(1,000)			(200)				
Combustible liquid <sup>c, i</sup>	II	H-2 or H-3	NA	120 <sup>d, e</sup>	NA	NA	NA	120 <sup>d</sup>	NA	30 <sup>d</sup>			
	IIIA	H-2 or H-3		330 <sup>d, e</sup>				330 <sup>d</sup>		80 <sup>d</sup>			
	IIIB	NA		13,200 <sup>e, f</sup>				13,200 <sup>f</sup>		3,300 <sup>f</sup>			
Cryogenic Flammable	NA	H-2	NA	45 <sup>d</sup>	NA	NA	45 <sup>d</sup>	NA	NA	10 <sup>d</sup>			
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA			
Cryogenic Oxidizing	NA	H-3	NA	45 <sup>d</sup>	NA	NA	45 <sup>d</sup>	NA	NA	10 <sup>d</sup>			
Explosives	Division 1.1	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	NA	NA	NA	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	Division 1.2	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>					0.25 <sup>g</sup>	(0.25) <sup>g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	Division 1.3	H-1 or H-2	5 <sup>e, g</sup>	(5) <sup>e, g</sup>					1 <sup>g</sup>	(1) <sup>g</sup>	1 <sup>g</sup>	(1) <sup>g</sup>	
	Division 1.4	H-3	50 <sup>e, g</sup>	(50) <sup>e, g</sup>					50 <sup>g</sup>	(50) <sup>g</sup>	NA	NA	
	Division 1.4G	H-3	125 <sup>e, l</sup>	NA					NA	NA	NA	NA	
	Division 1.5	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>					0.25 <sup>g</sup>	(0.25) <sup>g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	Division 1.6	H-1	1 <sup>e, g</sup>	NA					NA	NA	NA	NA	NA
Flammable gas <sup>t</sup>	Gaseous	H-2	NA	NA	1,000 <sup>d, e</sup>	NA	NA	NA	1,000 <sup>d, e</sup>	NA	NA		
	Liquefied			(150) <sup>d, e</sup>	NA			(150) <sup>d, e</sup>	NA				
Flammable liquid <sup>c</sup>	IA	H-2 or H-3	NA	30 <sup>d, e</sup>	NA	NA	NA	30 <sup>d</sup>	NA	10 <sup>d</sup>			
	IB and IC			120 <sup>d, e</sup>				120 <sup>d</sup>		30 <sup>d</sup>			
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120 <sup>d, e, h</sup>	NA	NA	NA	120 <sup>d, h</sup>	NA	NA	30 <sup>d, h</sup>		
Flammable solid	NA	H-3	125 <sup>d, e</sup>	NA	NA	125 <sup>d</sup>	NA	NA	NA	25 <sup>d</sup>	NA		
Inert Gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA	NA		
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA	NA		
Organic peroxide	UD	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	NA	NA	NA	NA	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	I	H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>						1 <sup>d</sup>	(1) <sup>d</sup>	1 <sup>d</sup>	(1) <sup>d</sup>
	II	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>						50 <sup>d</sup>	(50) <sup>d</sup>	10 <sup>d</sup>	(10) <sup>d</sup>
	III	H-3	125 <sup>d, e</sup>	(125) <sup>d, e</sup>						125 <sup>d</sup>	(125) <sup>d</sup>	25 <sup>d</sup>	(25) <sup>d</sup>
	IV	NA	NL	NL						NL	NL	NL	NL

		V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1 <sup>g</sup>	(1) <sup>e,g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	3 <sup>k</sup>	H-2 or H-3	10 <sup>d,e</sup>	(10) <sup>d,e</sup>		2 <sup>d</sup>	(2) <sup>d</sup>		2 <sup>d</sup>	(2) <sup>d</sup>	
	2	H-3	250 <sup>d,e</sup>	(250) <sup>d,e</sup>		250 <sup>d</sup>	(250) <sup>d</sup>		50 <sup>d</sup>	(50) <sup>d</sup>	
	1	NA	4,000 <sup>e,f</sup>	(4,000) <sup>e,f</sup>		4,000 <sup>f</sup>	(4,000) <sup>f</sup>		1,000 <sup>f</sup>	(1,000) <sup>f</sup>	
Oxidizing gas	Gaseous	H-3	NA	NA	1,500 <sup>d,e</sup>	NA	NA	1,500 <sup>d,e</sup>	NA	NA	
	Liquefied			(150) <sup>d,e</sup>	NA		(150) <sup>d,e</sup>	NA			
Pyrophoric	NA	H-2	4 <sup>e,g</sup>	(4) <sup>e,g</sup>	50 <sup>e,g</sup>	1 <sup>g</sup>	(1) <sup>g</sup>	10 <sup>e,g</sup>	0	0	
Unstable (reactive)	4	H-1	1 <sup>e,g</sup>	(1) <sup>e,g</sup>	10 <sup>e,g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	2 <sup>e,g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	3	H-1 or H-2	5 <sup>d,e</sup>	(5) <sup>d,e</sup>	50 <sup>d,e</sup>	1 <sup>d</sup>	(1) <sup>d</sup>	10 <sup>d,e</sup>	1 <sup>d</sup>	(1) <sup>d</sup>	
	2	H-3	50 <sup>d,e</sup>	(50) <sup>d,e</sup>	750 <sup>d,e</sup>	50 <sup>d</sup>	(50) <sup>d</sup>	750 <sup>d,e</sup>	10 <sup>d</sup>	(10) <sup>d</sup>	
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL	
Water reactive	3	H-2	5 <sup>d,e</sup>	(5) <sup>d,e</sup>	NA	5 <sup>d</sup>	(5) <sup>d</sup>	NA	1 <sup>d</sup>	(1) <sup>d</sup>	
	2	H-3	50 <sup>d,e</sup>	(50) <sup>d,e</sup>		50 <sup>d</sup>	(50) <sup>d</sup>		10 <sup>d</sup>	(10) <sup>d</sup>	
	1	NA	NL	NL		NL	NL		NL	NL	

For SI: 1 cubic foot = 0.02832 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L. NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

- a. For use of control areas, see Section 5003.8.3.
- b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
- c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
- d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e 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 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 220 pounds of solid or 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
  
- r. The maximum allowable refrigerant gas classified as Group A2L by ASHRAE 34 stored in DOT containers complying with 49 CFR Part 178 shall be unlimited.

**Reason Statement:** Group A1 refrigerants have long been considered unlimited for storage in warehouses. GHS classified flammable gas into three Categories, 1A, 1B, and 2. Group A2L refrigerants fall into Category 2B or 2 flammable gases. These two categories have a lower burning velocity, thus are not a storage hazard compared to Category 1A such as propane and acetylene. The storage in warehouses of these refrigerants is in DOT containers. These containers are safe for shipping and safe for storage in a warehouse. There is no significant conflagration hazard associated with storage of these tanks in a warehouse. This change will allow unlimited storage of Group A2L refrigerants. The allowance would require the storage to be in DOT containers complying with Federal Regulations 49 CFR Part 178.

**Cost Impact:** The code change proposal will decrease the cost of construction. This change will allow the common practice of permitting unlimited storage of Group A1 refrigerants. It will also allow the unlimited storage of Group A2L refrigerants. The refrigerant storage would not have to be classified as a high hazard building.

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency. This change has no impact on the resiliency of refrigerant storage.

## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Disapproval

**Workgroup 2 - Final Reason:** Item is being deleted in the 2018 SFPC, proposal would have to be in the VCC/IFC/IBC

## Public Comments for: FP5003.1.1(1)-18

**Discussion by Kenney Payne**

Aug 4, 2020 14:10 UTC

If this is approved, should similar changes be done in the VCC?

Proposal # 414

# **FP5003.1.1(2)-18**

**Proponents:** Julius Ballanco (JBENGINEER@aol.com)

## **2018 International Fire Code**

**Revise as follows:**

**TABLE 5003.1.1(1)**

MAXIMUM ALLOWABLE QUANTITY PER CONTROL AREA OF HAZARDOUS MATERIALS POSING A PHYSICAL HAZARD<sup>a, j, m, n, p</sup>

MATERIAL	CLASS	GROUP WHEN THE MAXIMUM ALLOWABLE QUANTITY IS EXCEEDED	STORAGE <sup>b</sup>			USE-CLOSED SYSTEMS <sup>b</sup>			USE-OPEN SYSTEMS <sup>b</sup>	
			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 <sup>q</sup>	Loose	H-3	(100)	NA	NA	(100)	NA	NA	(20)	NA
	Baled <sup>o</sup>		(1,000)			(1,000)			(200)	
Combustible liquid <sup>c, i</sup>	II	H-2 or H-3	NA	120 <sup>d, e</sup>	NA	NA	120 <sup>d</sup>	NA	NA	30 <sup>d</sup>
	IIIA	H-2 or H-3		330 <sup>d, e</sup>			330 <sup>d</sup>			80 <sup>d</sup>
	IIIB	NA		13,200 <sup>e, f</sup>			13,200 <sup>f</sup>			3,300 <sup>f</sup>
Cryogenic Flammable	NA	H-2	NA	45 <sup>d</sup>	NA	NA	45 <sup>d</sup>	NA	NA	10 <sup>d</sup>
Cryogenic Inert	NA	NA	NA	NA	NL	NA	NA	NL	NA	NA
Cryogenic Oxidizing	NA	H-3	NA	45 <sup>d</sup>	NA	NA	45 <sup>d</sup>	NA	NA	10 <sup>d</sup>
Explosives	Division 1.1	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.2	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>		0.25 <sup>g</sup>	(0.25) <sup>g</sup>		0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.3	H-1 or H-2	5 <sup>e, g</sup>	(5) <sup>e, g</sup>		1 <sup>g</sup>	(1) <sup>g</sup>		1 <sup>g</sup>	(1) <sup>g</sup>
	Division 1.4	H-3	50 <sup>e, g</sup>	(50) <sup>e, g</sup>		50 <sup>g</sup>	(50) <sup>g</sup>		NA	NA
	Division 1.4G	H-3	125 <sup>e, l</sup>	NA		NA	NA		NA	NA
	Division 1.5	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>		0.25 <sup>g</sup>	(0.25) <sup>g</sup>		0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	Division 1.6	H-1	1 <sup>e, g</sup>	NA		NA	NA		NA	NA
Flammable gas <sup>t</sup>	Gaseous	H-2	NA	NA	1,000 <sup>d, e</sup>	NA	NA	1,000 <sup>d, e</sup>	NA	NA
	Liquefied			(150) <sup>d, e</sup>	NA		(150) <sup>d, e</sup>	NA		
Flammable liquid <sup>c</sup>	IA	H-2 or H-3	NA	30 <sup>d, e</sup>	NA	NA	30 <sup>d</sup>	NA	NA	10 <sup>d</sup>
	IB and IC			120 <sup>d, e</sup>			120 <sup>d</sup>			30 <sup>d</sup>
Flammable liquid, combination (IA, IB, IC)	NA	H-2 or H-3	NA	120 <sup>d, e, h</sup>	NA	NA	120 <sup>d, h</sup>	NA	NA	30 <sup>d, h</sup>
Flammable solid	NA	H-3	125 <sup>d, e</sup>	NA	NA	125 <sup>d</sup>	NA	NA	25 <sup>d</sup>	NA
Inert Gas	Gaseous	NA	NA	NA	NL	NA	NA	NL	NA	NA
	Liquefied	NA	NA	NA	NL	NA	NA	NL	NA	NA
Organic peroxide	UD	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>
	I	H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>		1 <sup>d</sup>	(1) <sup>d</sup>		1 <sup>d</sup>	(1) <sup>d</sup>
	II	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>		50 <sup>d</sup>	(50) <sup>d</sup>		10 <sup>d</sup>	(10) <sup>d</sup>
	III	H-3	125 <sup>d, e</sup>	(125) <sup>d, e</sup>		125 <sup>d</sup>	(125) <sup>d</sup>		25 <sup>d</sup>	(25) <sup>d</sup>
	IV	NA	NL	NL		NL	NL		NL	NL

		V	NA	NL	NL		NL	NL		NL	NL
Oxidizer	4	H-1	1 <sup>g</sup>	(1) <sup>e, g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	NA	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	3 <sup>k</sup>	H-2 or H-3	10 <sup>d, e</sup>	(10) <sup>d, e</sup>		2 <sup>d</sup>	(2) <sup>d</sup>		2 <sup>d</sup>	(2) <sup>d</sup>	
	2	H-3	250 <sup>d, e</sup>	(250) <sup>d, e</sup>		250 <sup>d</sup>	(250) <sup>d</sup>		50 <sup>d</sup>	(50) <sup>d</sup>	
	1	NA	4,000 <sup>e, f</sup>	(4,000) <sup>e, f</sup>		4,000 <sup>f</sup>	(4,000) <sup>f</sup>		1,000 <sup>f</sup>	(1,000) <sup>f</sup>	
Oxidizing gas	Gaseous	H-3	NA	NA	1,500 <sup>d, e</sup>	NA	NA	1,500 <sup>d, e</sup>	NA	NA	
	Liquefied			(150) <sup>d, e</sup>	NA		(150) <sup>d, e</sup>	NA			
Pyrophoric	NA	H-2	4 <sup>e, g</sup>	(4) <sup>e, g</sup>	50 <sup>e, g</sup>	1 <sup>g</sup>	(1) <sup>g</sup>	10 <sup>e, g</sup>	0	0	
Unstable (reactive)	4	H-1	1 <sup>e, g</sup>	(1) <sup>e, g</sup>	10 <sup>e, g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	2 <sup>e, g</sup>	0.25 <sup>g</sup>	(0.25) <sup>g</sup>	
	3	H-1 or H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>	50 <sup>d, e</sup>	1 <sup>d</sup>	(1) <sup>d</sup>	10 <sup>d, e</sup>	1 <sup>d</sup>	(1) <sup>d</sup>	
	2	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>	750 <sup>d, e</sup>	50 <sup>d</sup>	(50) <sup>d</sup>	750 <sup>d, e</sup>	10 <sup>d</sup>	(10) <sup>d</sup>	
	1	NA	NL	NL	NL	NL	NL	NL	NL	NL	
Water reactive	3	H-2	5 <sup>d, e</sup>	(5) <sup>d, e</sup>	NA	5 <sup>d</sup>	(5) <sup>d</sup>	NA	1 <sup>d</sup>	(1) <sup>d</sup>	
	2	H-3	50 <sup>d, e</sup>	(50) <sup>d, e</sup>		50 <sup>d</sup>	(50) <sup>d</sup>		10 <sup>d</sup>	(10) <sup>d</sup>	
	1	NA	NL	NL		NL	NL		NL	NL	NL

For SI: 1 cubic foot = 0.02832 m<sup>3</sup>, 1 pound = 0.454 kg, 1 gallon = 3.785 L.

NA = Not Applicable, NL = Not Limited, UD = Unclassified Detonable.

- a. For use of control areas, see Section 5003.8.3.
- b. The aggregate quantity in use and storage shall not exceed the quantity listed for storage.
- c. The quantities of alcoholic beverages in retail and wholesale sales occupancies shall not be limited providing the liquids are packaged in individual containers not exceeding 1.3 gallons. In retail and wholesale sales occupancies, the quantities of medicines, foodstuff or consumer products and cosmetics containing not more than 50 percent by volume of water-miscible liquids with the remainder of the solutions not being flammable shall not be limited, provided that such materials are packaged in individual containers not exceeding 1.3 gallons.
- d. Maximum allowable quantities shall be increased 100 percent in buildings equipped throughout with an approved automatic sprinkler system in accordance with Section 903.3.1.1. Where Note e 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 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 220 pounds of solid or 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.
- r. The maximum allowable refrigerant gas stored during a repair or replacement in a pressure vessel complying with ASME BPVC Section VIII located inside a machinery room shall be unlimited.
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## Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Consensus Disapproval

**Workgroup 2 - Final Reason:** Item is being deleted in the 2018 SFPC, proposal would have to be in the VCC/IFC/IBC

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## Public Comments for: FP5003.1.1(2)-18

**Discussion by Kenney Payne**

Aug 4, 2020 14:11 UTC

If this is approved, should similar changes be made to the VCC?

Proposal # 415

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# FP5707.1-18

Proponents: Irene Koulouris

## 2018 International Fire Code

Revise as follows:

~~7. Change Section 5707.1 and delete Sections 5707.1.1 through 5707.6.3:~~

~~5707.1 Mobile fueling operations. Delivery of Class I, Class II, and Class III liquids to the fuel tank of a highway vehicle from a tank vehicle, a tank carried on a vehicle, or a nonportable container is prohibited.~~

~~Exceptions:~~

~~1. The refueling of highway vehicles in an emergency.~~

~~2. The refueling of vehicles in compliance with Sections 5706.5.4.1 through 5706.5.4.5.~~

~~3. Vehicles used for farm operations and machinery.~~

### SECTION 5707 ON-DEMAND MOBILE FUELING OPERATIONS

**5707.1 General.** On-demand mobile fueling operations that dispense Class I, II and III liquids into the fuel tanks of motor vehicles shall comply with Sections 5707.1 through 5707.6.3.

**Exception:** Fueling from an *approved* portable container in cases of an emergency or for personal use.

**5707.1.1 Approval required.** Mobile fueling operations shall not be conducted without first obtaining a *permit* and approval from the *fire code official*. Mobile fueling operations shall occur only at *approved* locations.

**5707.2 Mobile fueling vehicle.** An on-demand mobile fueling vehicle shall be one of the following:

1. A vehicle that has chassis-mounted tanks or containers where the aggregate cargo capacity does not exceed 1200 gallons (4592 L). A mobile fueling vehicle with a mounted *tank* in excess of 110 gallons (415 L) shall comply with the requirements of Section 5706.6, Section 5707 and NFPA 385.
2. A vehicle that carries a maximum of 60 gallons (227 L) of motor fuel in metal safety cans *listed* in accordance with UL 30 or other *approved* metal containers, each not to exceed 5 gallons (19 L) in capacity. Containers shall be secured to the mobile fueling vehicle except when in use.

The mobile fueling vehicle shall comply with all local, state and federal requirements. The mobile fueling vehicle and its equipment shall be maintained in good repair.

**5707.3 Required documents.** Documents developed to comply with Sections 5707.3.1 through 5707.3.3 shall be updated as necessary by the *owner* of the mobile fueling operation and shall be maintained in compliance with Section 108.3.

**5707.3.1 Safety and emergency response plan.** Mobile fueling operators shall have an *approved* written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code.

**5707.3.2 Training records.** Mobile fueling vehicles shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

**5707.3.3 Site plan.** Where required by the *fire code official*, a site plan shall be developed for each location at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate: all buildings, structures, *lot lines*, property lines and appurtenances on site and their use or function; all uses adjacent to the *lot lines* of the site; fueling locations, the locations of all storm drain openings and adjacent waterways or wetlands; information regarding slope, natural drainage, curbing, impounding and how a spill will be kept on the site property; and the scale of the site plan.

**5707.4 Mobile fueling areas.** Mobile fueling shall not occur on public streets, *public ways* or inside *buildings*. Fueling on the roof level of parking structures or other *buildings* is prohibited.

**5707.4.1 Separation.** Mobile fueling shall not take place within 25 feet (7620 mm) of buildings, property lines or combustible storage.

**Exception:** The *fire code official* shall be authorized to decrease the separation distance for dispensing from metal safety cans or other *approved* metal containers in accordance with Section 5707.2.

Where dispensing operations occur within 15 feet (4572 mm) of a storm drain, an *approved* storm drain cover or an *approved* equivalent method that will prevent any fuel from reaching the drain shall be used.

**5707.4.2 Sources of ignition.** Smoking, open flames and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle or the point of fueling shall be prominently posted on the mobile fueling vehicle. The engines of vehicles being fueled shall be shut off during fueling.

**5707.5 Equipment.** Mobile fueling equipment shall comply with Sections 5707.5.1 through 5707.5.4.

**5707.5.1 Dispensing hoses and nozzles.** Where equipped, the dispensing hose shall not exceed 50 feet (15 240 mm) in length. The dispensing nozzles and hoses shall be of an *approved* and *listed* type.

**5707.5.2 Fuel limit.** Mobile fueling vehicles shall be equipped with a fuel limit switch set to a maximum of 30 gallons (116 L) and a nozzle or other *approved* device that, when activated, immediately causes flow of fuel from the mobile fueling vehicle to cease.

**5707.5.3 Fire extinguisher.** An *approved* portable fire extinguisher complying with Section 906 with a minimum rating of 40-B:C shall be provided on the mobile fueling vehicle with signage clearly indicating its location.

**5707.5.4 Spill kit.** Mobile fueling vehicles shall contain a minimum 5-gallon (19 L) spill kit of an *approved* type.

**5707.6 Operations.** Mobile fueling vehicles shall be constantly attended during fueling operations with brakes set and warning lights in operation. Mobile fueling vehicles shall not obstruct emergency vehicle access roads.

**5707.6.1 Dispensing hose.** Where equipped, mobile fueling vehicles shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be properly placed on an *approved* reel or in an *approved* compartment prior to moving the mobile fueling vehicle.

**5707.6.2 Drip control.** Operators shall place a drip pan or an absorbent pillow under the nozzle and each fuel fill opening prior to and during dispensing operations to catch drips.

**5707.6.3 Spill reporting.** Spills shall be reported in accordance with Section 5003.3.1.

**Reason Statement:** We are cordially requesting the Virginia amendment to remove section 5707 of the International Fire Code be removed in order to allow mobile fueling to occur within the Commonwealth of Virginia per the Statewide Fire Prevention Code (SFPC). We understand that currently, the law would prohibit this from occurring and that even with a change to the SFPC, the General Assembly would still need to approve mobile fueling in Virginia. Specifically, we are asking for the Board of Housing and Community Development (BHCD) through the SFPC to allow the delivery of Class I, II, and III liquids into the fuel tanks of motor vehicles. Mobile fueling can promote many environmental benefits. Traditional gas stations utilizing underground storage tanks (USTs) frequently fail and pose a threat to drinking water supply and community health. Additionally, traditional gas stations are frequent sites of spills and additional vapor emissions. Small gasoline spills frequently occur at gasoline dispensing stations and each gas station spills approximately 40 gallons of fuel a year, which creates high risks for our communities. (Hilpert M. (2014). Infiltration and Evaporation of Small Hydrocarbon Spills at Gas Stations, Journal of Contaminant Hydrology, DOI). Mobile fueling, but specifically Booster Fuels, not only eliminates the need for USTs but also substantially reduces the risk of spills with Booster's hazmat endorsed and trained service professionals.

Additionally, mobile fueling can help the Commonwealth's elderly and disabled population. For our most vulnerable populations, access to traditional gas stations has proven to be extremely difficult and even impossible, despite the passage of the Americans with Disabilities Act (ADA). The ADA requires that self-serve gas stations provide equal access to their customers with disabilities through assistance if requested, either through honking or a button. However, even with the ADA, 15-million drivers with disabilities across the country still have difficulty getting gas at almost 160,000 stations according to U.S. House of Representatives Member Tammy Duckworth. Mobile fueling makes fuel safer and more accessible for everyone by delivering directly to the consumer.

Currently, mobile fueling is permitted in California, Washington, Oregon, Texas, Tennessee, and Maryland. Booster is permitted to operate in each of those locales.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction. With the proposed modification of the code, there shall not be an increase or decrease of the cost of construction as mobile fueling does not erect any new permanent locations which would need construction: mobile fueling utilizes existing buildings.

**Resiliency Impact Statement:** This proposal will neither increase nor decrease Resiliency

## Workgroup Recommendation

Workgroup 2 - Final Committee Action: Consensus Disapproval

Workgroup 2 - Final Reason:

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## Public Comments for: FP5707.1-18

This proposal doesn't have any public comments.

Proposal # 319

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Booster Fuels, Inc.  
1840 Gateway Drive  
Suite 200  
San Mateo, CA 94404

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## **BOOSTER FUELS COMPLIANCE WITH IFC §5707 (2018 EDITION)**

This document demonstrates how Booster Fuels complies with the requirements of Section 5707 of the International Fire Code (IFC), 2018 Edition. For ease of reference, Booster's methods of compliance are highlighted below in bold type italics below the relevant provisions of §5707. The IFC commentary is indicated by italics.

### **SECTION 5707: ON-DEMAND MOBILE FUELING**

**5707.1 General.** On-demand mobile fueling operations that dispense Class I, II, and III liquids into the fuel tanks of motor vehicles shall comply with Sections 5707.1 through 5707.6.3.

Exception: Fueling from an approved portable container in cases of an emergency or for personal use.

**5707.1.1 Approval required.** Mobile fueling operations shall not be conducted without first obtaining a permit and approval from the fire code official. Mobile fueling operations shall occur only at approved locations.

*A fire code official may also choose to issue a site permit for fueling on a specific site or within specific areas. Site permits are not required by code, as an operational permit often gives broad fueling authority, recognizing that the mobile fueling operator is responsible for deciding if fueling is permitted prior to each fueling operation. See Section 5707.3.3.*

***This commentary clearly contemplates that site permits are not absolutely required and that an operational permit may be issued to cover an entire jurisdiction.***

**5707.2 Mobile fueling vehicle.** An on-demand mobile fueling vehicle shall be one of the following:

1. A tank vehicle complying with NFPA 385 that has chassis-mounted tanks or containers where the aggregate cargo capacity does not exceed 1200 gallons (4592 L). A mobile fueling vehicle with a mounted tank in excess of 110 gallons (415 L) shall comply with the requirements of Section 5706.6, Section 5707 and NFPA 385.

**Booster's proprietary trucks are compliant with NFPA 385 and were constructed by vendors familiar with NFPA 385 requirements, but please note that there is no such thing as a NFPA 385 "certification." However, our trucks are also compliant with DOT Rule 406 and our Rule 406 certificate is attached as Exhibit A. See Also Booster Standard Operating Procedures ("SOP"); Exhibit B, Booster Driver Training Overview, Exhibit C; and Booster Safety and Emergency Procedures, Exhibit D regarding compliance with Sections 5706.6. See this entire document regarding compliance with Section 5707.**

2. A vehicle that carries a maximum of 60 gallons (227 L) of motor fuel in metal safety cans listed in accordance with UL 30 or other approved metal containers, each not to exceed 5 gallons (19 L) in capacity. Containers shall be secured to the mobile fueling vehicle except when in use. The mobile fueling vehicle shall comply with all local, state and federal requirements. The mobile fueling vehicle and its equipment shall be maintained in good repair.

***The only container that is carried in the mobile fueling vehicle is the "spill bucket" and it is secured to the vehicle when not in use.***

***Our trucks undergo eight different regular, rigorous inspections, including:***

- ***A daily post-trip inspection for any day that the trucks are driven***
- ***A 78-point inspection every 30 days***
- ***An 85-point BIT inspection every 90 days which includes brakes, steering, suspension, tires and wheels.***
- ***Annual multi-level third party, DOT inspection***

***See Sample Maintenance Logs, Exhibit E.***

**5707.3 Required documents.** Documents developed to comply with Sections 5707.3.1 through 5707.3.3 shall be updated as necessary by the owner of the mobile fueling operation and shall be maintained in compliance with Section 108.3.

***We maintain required documents for not less than 12 months after the end of service, far longer than the 180 days required by Section 108.3 of the IFC.***

**5707.3.1 Safety and emergency response plan.** Mobile fueling operators shall have an approved written safety and emergency response plan that establishes policies and procedures for fire safety, spill prevention and control, personnel training and compliance with other applicable requirements of this code.

***See Exhibit D.***

**5707.3.2 Training records.** Mobile fueling vehicles shall be operated only by designated personnel who are trained on proper fueling procedures and the safety and emergency response plan. Training records of operators shall be maintained.

***Available upon request to protect the privacy of our employees.***

**5707.3.3 Site plan.** Where required by the fire code official, a site plan shall be developed for each location at which mobile fueling occurs. The site plan shall be in sufficient detail to indicate: all buildings, structures, lot lines, property lines and appurtenances on site and their use or function; all uses adjacent to the lot lines of the site; fueling locations, the locations of all storm drain openings and adjacent waterways or wet lands; information regarding slope, natural drainage, curbing, impounding and how a spill will be kept on the site property; and the scale of the site plan.

*A fire code official may choose to require site permits for individual sites or areas. If required, a site plan may also be required to accompany the site permit. The site plan is intended to only be detailed enough to identify permitted fueling areas with respect to set backs from buildings, storage, ignition sources, lot lines and storm drains or other environmental concern. If sloped grading is present within fueling areas, then information regarding how a spill will be retained must be provided.*

***Booster is including this commentary to note that as per the commentary above, a site permit is not required by §5707; rather, it is a requirement that the fire code official may choose to require, and numerous jurisdictions do not require it. However, Booster is providing an example of such a site plan from a jurisdiction where it is required. See Exhibit F.***

**5707.4 Mobile fueling areas.** Mobile fueling shall not occur on public streets, public ways, or inside buildings. Fueling on the roof level of parking structures or other buildings is prohibited.

***See Exhibit B. Also, please note that the Booster app only permits requests for fueling in places that are compliant with 5707.***

**5707.4.1 Separation.** Mobile fueling shall not take place within 25 feet (7620 mm) of buildings, property lines, or combustible storage.

***See Exhibit B.***

Exception: The fire code official shall be authorized to decrease the separation distance for dispensing from metal safety cans or other approved metal containers in accordance with Section 5707.2.

Where dispensing operations occur within 15 feet (4572 mm) of a storm drain, an approved storm drain cover or an approved equivalent method that will prevent any fuel from reaching the drain shall be used.

**See Exhibit B.**

**5707.4.2 Sources of ignition.** Smoking, open flames, and other sources of ignition shall be prohibited within 25 feet (7620 mm) of fuel dispensing activities. Signs prohibiting smoking or open flames within 25 feet (7620 mm) of the vehicle and the point of fueling shall be prominently posted on the mobile fueling vehicle. The engines of vehicles being fueled shall be shut off during fueling.

**See Exhibit C.**

**5707.5 Equipment.** Mobile fueling equipment shall comply with Sections 5707.5.1 through 5707.5.4.

**5707.5.1 Dispensing hoses and nozzles.** Where equipped, the dispensing hose shall not exceed 50 feet (15240 mm) in length. The dispensing nozzles and hoses shall be of an approved and listed type.

***All of our hoses are 50 feet or less. All componentry has been approved by the California Air Resources Board. See Hose and Nozzle specifications, Exhibit G, and document regarding the POW 66SB Swivel Breakaway, Exhibit H. Also see memorandum from Andrew Klein, Exhibit K.***

Exception: Mobile fueling vehicles equipped with an approved brake interlock tied to the nozzle holder that prohibits movement of the mobile fueling vehicle when the nozzle is removed from its holder.

**5707.5.2 Fuel limit.** Mobile fueling vehicles shall be equipped with a fuel limit switch set to a maximum of 30 gallons (116 L) and a nozzle or other approved device that, when activated, immediately causes flow of fuel from the mobile fueling vehicle to cease.

**See Exhibits G & I**

**5707.5.3 Fire extinguisher.** An approved portable fire extinguisher complying with Section 906 with a minimum rating of 40-B:C shall be provided on the mobile fueling vehicle with signage clearly indicating its location.

**See *Driver Training Manual, Exhibit C, and picture displaying an approved fire extinguisher on a Booster truck, Exhibit J.***

**5707.5.4 Spill kit.** Mobile fueling vehicles shall contain a minimum 5 gallon (19 L) spill kit of an approved type.

**See Exhibit B.**

**5707.6 Operations.** Mobile fueling vehicles shall be constantly attended during fueling operations with brakes set and warning lights in operation. Mobile fueling vehicles shall not obstruct emergency vehicle access roads.

**See Exhibit B.**

**5707.6.1 Dispensing hose.** Where equipped, mobile fueling vehicles shall be positioned in a manner to preclude traffic from driving over the dispensing hose. The dispensing hose shall be placed on an approved reel or in an approved compartment prior to moving the mobile fueling vehicle.

**See Exhibit B.**

**5707.6.2 Spill Reporting.** Spills shall be reported in accordance with Section 5003.3.1. If a spill occurs in quantities that exceed the thresholds of federal, state and local reporting regulations, the fire code official must be notified.

**See Exhibit D.**

**EXHIBIT A-DOT R. 406 Certificate**

Department of Transportation  
**Certificate of Compliance**

Issued by Mid-State Tank Co., Inc.

SKYMARK REFUELERS, LLC

Purchaser

This certifies that the new Mid-State Tank Co., Inc. tank identified below was designed, constructed and tested in accordance with the Department of Transportation Motor Vehicle Cargo Tank Specifications No. DOT 406 for cargo tank used for the transportation of classified liquids.

Vehicle Type Tank Capacity 1240 Gallon No. of Compartments 2 Date Shipped February, 2018

Year Fabricated 2018 Mid-State Tank Co., Inc. Serial No. DA00348 Mid-State Tank Co., Inc. Model No. A8615

Manufactured by Mid-State Tank Co., Inc. at Arthur, Illinois

**CERTIFICATION**

*Items not installed at time of shipment:*

- Para. 178.345-6 Tank Shipped Un-mounted
- Para. 178.345-8(a)(4-5) Piping & Road Clearance
- Para. 178.345-8(b) Bottom Damage Protection
- Para. 178.345-8(d) Rear End Protection
- Para. 178.345-9 Piping
- Para. 178.345-10 Vents
- Para. 178.345-11 Tank Outlets
- Para. 178.345-13(c) Leakage Test
- Para. 178.345-14(c) Specification Plate Incomplete

Above items installed: \_\_\_\_\_

By: \_\_\_\_\_

Authorized Signature CT# \_\_\_\_\_

Registered Inspector CT# \_\_\_\_\_

Cargo Tank complies to the Specifications No. \_\_\_\_\_ as shipped. CERTIFICATION DATE \_\_\_\_\_

Cargo Tank complies to the DOT 406 Specifications Except those items listed opposite.



Engineering Jacob Studya

Authorized Mid-State Tank Co., Inc. Signature Gary Conlin

CT - 13167

MID-STATE TANK CO., INC.  
1357 JONATHAN CREEK ROAD PO BOX 317  
SULLIVAN, IL 61951

### WARRANTY

MID-STATE TANK CO., INC. warrants to the original purchaser that, subject to the conditions and limitations set forth below, a new tank, D.O.T. 406 / 407, of its manufacture which leaks at anytime during the five year period following the date of manufacture will be repaired at Mid-State Tank's expense.

Repairs will be made or authorized to be made only after MID-STATE TANK is notified of the problem and acknowledges that the problem is a result of defective materials or workmanship. Repairs under this warranty will be made at the MID-STATE TANK plant in Sullivan, Illinois or after explicit authorization from MID-STATE TANK, at a repair shop approved by MID-STATE TANK. Payment for repairs made at an approved repair shop will be made only after a written description of the defect and a summary of the repair costs are received by MID-STATE TANK at its Sullivan, Illinois office.

This Warranty covers only MID-STATE TANK tanks, and if truck mounted, only those mounted by an approved MID-STATE TANK distributor in accordance with MID-STATE TANK mounting procedures. MID-STATE TANK assumes no responsibility for problems arising out of improper mounting when that is done by anyone other than a MID-STATE TANK approved distributor or defects caused or related to accident or improper use, alteration and maintenance.

Purchased equipment, accessories, and truck chassis are not included in this Warranty, and are covered if at all, only by any Warranty of the original manufacturer. No Warranty, expressed or implied; including the implied Warranties of merchantability and fitness is made or authorized to be made with respect to tanks except that explicitly set forth herein. Damages for the cost of loss of product, or any other consequential damages are excluded from this Warranty, and the assumption of any obligation with respect to such damages is expressly not authorized.

Date: FEBRUARY 2018

S/N: DA00348

By: *[Signature]*

Title: PRESIDENT

MID-STATE TANK CO., INC.



## DOT Cargo Tank Test & Inspection Report

### Cargo Tank Owner Information

Owner: Skymark Refuelers

Owner Address: 610 Adams Street, Kansas City, KS 66105

Special Service of Cargo Tank: Unknown

### Cargo Tank Manufacturer Specifications

Manufacturer: Mid-State Tank Co., Inc. Year Manufactured: 2018 Mfr. Serial No.: DA00348

DOT Specification No.: 406 Lined: No Insulated: No MAWP: 3.3 psi

Nom. Capacity (US gal): 1. 720 2. 520 3.        4.        5.        6.        Total: 1240

Material Specification: Shell SB209-5454H32 Head SB209-5454H0

Mfd. Shell Thickness: Top .210 Sides .210 Bottom .210 Mfd. Head Thickness: .210

Minimum Shell/Head Thickness: .151/.160 Head Size: 44" x 78" Shell Length: 103"

### Pressure Test and Inspection

Hydrostatic Test Pressure: 5 psi Test Pressure Holding Time: 10 min Fluid Used: Water

Date of Test: 2/19/2018 Are there any leaks?        Yes X No

Notes:

1. Fusible caps, vacuum vents, rupture disc and all reclosing pressure relief valves must be removed and the outlets blanked off for pressure test procedure. (Procedure must be completed for each compartment)
2. On compartment tanks only one compartment can be filled with liquid and tested at a time. All adjacent compartments must be empty.
3. With the internal valves closed, manhole closed and secured, and the external valve open, apply water pressure to applicable test pressure for tank being tested. Test pressure must be maintained for 10 minutes for successful test.
4. Inspect all surfaces and component installations for leaks; pay particular attention to manhole assembly and valve sumps.



**External Visual Inspection**

Put X in applicable box, or N/A if not applicable					
Tank Shell/Heads, Are there any:	Yes	No	Overturn/Manhole, Are there any:	Yes	No
Dents		X	Defects in dome cover		X
Distortions		X	Defects in gaskets		X
Defects in welds		X	Overturn drains clogged		X
Leaks of any kind		X	Defects in overturn assembly		X
Conditions that might render tank unsafe		X	Leaks of any kind		X
External Piping/Valves, Are there any:			Bolts/Flanges, Are there any:		
Defects in welds	N/A	N/A	Bolts or nuts missing	N/A	N/A
Defects in valves or gaskets	N/A	N/A	Loose bolts	N/A	N/A
Defects in safety valve operator	N/A	N/A	Are any items not in good working condition:		
Defects in remote control	N/A	N/A	Lights	N/A	N/A
Leaks of any kind	N/A	N/A	U Bolts	N/A	N/A
Conditions that might render tank unsafe	N/A	N/A	Ladder	N/A	N/A

**Internal Visual Inspection**

Put X in applicable box, or N/A if not applicable					
Tank Shell/Heads, Are there any:	Yes	No	Tank Components, Are there any:	Yes	No
Distortions		X	Defects in baffles	X	
Defects in welds		X	Defects in dip tube	N/A	N/A
Leaks of any kind		X	Conditions that might render tank unsafe		X

**Compartment Capacity Measurements**

Compartment number (front to rear)	1	2	3	4	5	6
Capacity above indicator (US gal)	41	68				
Distance from front indicator to top of manway collar (in)	N/A	N/A				
Distance from rear indicator to top of manway collar (in)	5 1/2"	8 3/4"				
Compartment capacity below indicator (US gal)	720	520				

We certify that the information in this report is correct and in accordance with the requirements of 49 CFR §180.407

BILL ANDERSON  
Name of RI performing tests and inspections

510 East Progress Street, Arthur, IL 61911  
Address of RI performing tests and inspections

Bill Anderson  
Signature of RI performing tests and inspections

2-23-2018  
Date

CT-13167  
DOT Registration Number

**EXHIBIT B-Booster Standard Operating Procedures**

# **BOOSTER STANDARD FUELING PROCEDURES & HANDLING**

## Driver Checklist

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### Time card

- Clock in and out at the yard at the beginning and end of your day.
- Clocking in and out for lunch is done on the Ipad.
- Check ADP weekly to make sure your times match and there isn't any discrepancies.

### Thorough pre-trip

- Complete pre-trip check on fleetio.
- Check Vehicle Binder, BOL, DEF, Chassis fuel level, DPF Regen, Wipers/Fluid, Horn, Steering Mechanism, Hydraulic brake check, Parking brake check, Mirrors, Engine, Transmission, Lighting devices and reflectors, Tires, wheels and rims, Air tank, Air compressor, Emergency equipment, Spill kit duffle, Spill kit seal, Spill bucket (always full), Drain cover mats, Absorbent socks, Drip mat, Hose reel, Fuel hose, Fuel nozzle, and Meter.
- Equipment introduction (cover all components): Compressor, Power, Meter, Pump lever. What steps to take incase the pump will not start.
- Walk around check all compartments for proper equipment. Fire extinguisher, Emergency response guidebook, BOL, Cones, Spill kit, Pads, Add-ons, Air gauge, Gloves, Shovel, and Broom.
- Clean front windshields and mirrors.
- Show inventory on the meter and make sure it matches Wilson
- Post meter start gallons on Wilson.

### Wilson

- Log into Wilson.
- Different kind of pins and what they mean: P=Premium, solid color circle=regular, AM's=red, Any time=Green, Rush=Orange, Star=add-ons & valet, Hybrids=Lock, Partial fills=blue with a gas drop, Pause pins= blue with !.
- Find your assigned zone, navigating to a zone.
- What is the best route to start on a campus, Have a game plan.
- Reporting a problem on Wilson, go through different scenarios, try to report problems on wilson before using Slack.

### Slack

- Proper use of Slack try to report problems on wilson before reporting on Slack.
- Use @cx and @sjdispatch to report any issues in the field.
- Be respectful on Slack no profanity or offensive content.
- Notify @sjdispatch when leaving a campus.
- How to take pictures of add-ons that can not be completed due to damage. Tires, Windshields, Fuel doors ect.
- Over communicate.

### Safety

- No use of phone or apps while driving.

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- Fire extinguisher is up to date, Spill kit has zip tie, Spill bucket is full and contains hazmat stickers and tape.
- Overview, in case of a spill what do you do? Contact Leads.
- 25 ft rule for storm drains, smokers, buildings, and pedestrians.
- 5 mph and strobe lights on as soon as you arrive on a campus.
- Be aware of your surrounding.

### **Defensive driving**

- SIPDE = Scan, Identify, Predict, and Execute.
- Maintain a safe following distance. (3 car lengths)
- Scan for hazards.
- Check rear view mirrors for hazards before moving on to your next fill.
- Share your Experiences, situations on the road.

### **Campus**

- Pull over and figure out the best route to take on the campus.
- Strobes on, 5 MPH
- Scan for hazards, Pedestrians, Cars, Storm drains, and Smokers.
- Have your process down.

### **Post-trip**

- Use fleetio To do a thorough post-trip.
- Clean interior and exterior of the truck.
- Post a picture of the ending gallons on slack.
- Lock the doors.
- Make sure your lights are off.

### **End of day**

- Fuel the chassis of your truck daily if under half a tank.
- Clean the interior and exterior of your truck daily.
- Make sure you return your keys to at the end of your shift.
- Report any issues with your truck.
- Communicate with you team leads.

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# BOOSTER

## STANDARD FUELING PROCESS

Effective 06.01.2018

Fueling Process Steps
Seat belts on
Tablet/Cell in cradle while moving
All flashers and strobes on and 5 mph speed limit while locating vehicle
Locate vehicle
Check for open fuel door (older vehicles may not have door lock mechanism) <b>** If closed, document in slack channel and move to next fill **</b>
Position tank vehicle to prevent traffic from driving over the delivery hose and such that it does not obstruct emergency vehicle access roads
Set brakes
Confirm grade-Reg or Prem?
Write TY note to delight customer
Leave tanker once all safety equipment is secure
Inspect locations for storm drains
If drain present within 15 feet, set absorbent booms or storm drain covers <b>** Do not fuel if raining ***</b>
Inspect locations for stormwater drains
If stormwater drains present within 15 feet, place a 10 foot absorbent boom between the fill point and the stormwater drain to prevent spills from reaching the stormwater drain
Check for electrical equipment located within 25 feet horizontally or 25 feet vertically of the dispensing nozzle <b>** Do not fuel if present and document in Slack channel **</b>
Ensure the dispensing nozzle at all times is greater than 25 feet from buildings, property lot lines, public streets, public alleys, public ways, combustible storage, ignition sources, or members of the public
Confirm engine of vehicle being fueled is shut off
Keep vehicle flashers on during dispensing operations
Set cones
Inspect vehicle and surroundings for anomalies
Set absorbent pillow under the nozzle to capture any spillover (yellow label towards tire)
Open fuel tank and cap
TY card in driver's window
Return to tanker to commence fueling operations
Select associated Internal Valve (back/front) for product grade (premium/regular) <b>** Assure other valve is closed to prevent fuel mixing **</b>
Confirm Emergency switch (2) are set to ON
Visually confirm fuel grade to be selected by cross-check with magnetic stickers (fuel deck/Meter house)
Select Start TCS Meter (meter sets to zero)
Active Product List > Toggle Front & Back
Select Start Twice to activate pump
Wrap nozzle with absorbent pad
Pull enough hose/no tension/lays on ground
Keep fuel cap off customer vehicle
Bond the mobile fueling vehicle to the vehicle being fueled by using a UL listed hose and nozzle.
Start fueling and remain at fill point monitoring entire fill process
Remove nozzle/no drips/absorbent pad
Cap fuel tank/close fuel door
Pick up absorbent pillow & storm drain cover if applicable
Retract fuel hose
Record fuel dispensed
Turn pump off & close internal valve
Close pump housing rollup doors
Replace cones in designated holders/location
Confirm gallons
Enter gallons in Winston
Seat belts on



# BOOSTER

## NON-VEHICLE FUELING PROCESS

Effective 11.01.2018

### **S T O P**

**\*\* Manager MUST approve ALL Non-Vehicle Fueling events \*\***

#### **WHAT MARKET?**

1. SF
2. South Coast (OC/LA)
3. SD
4. Dallas

**\*\* NO NON-VEHICLE FUELING IN SOUTH COAST \*\***

- **ONLY 100% ORVR FUELING UNLESS CARB APPROVED GAS CAN OR RELATED EQUIPMENT**
- **ALL GAS CANS AND RELATED EQUIPMENT MUST BE APPROVED BY MANAGER**
- **STRICT COMPLIANCE TO ORVR FUELING GUIDELINE**

#### **WHAT IS NON-VEHICLE?**

1. **GAS CANS**
2. Lawnmowers
3. Off-Road Vehicles / Gators
4. Generators
5. Motorcycles
6. Anything that is not a standard On-Road Make, Year, Model

**\*\* IF YOU HAVE TO ASK—CALL A MANAGER \*\***

#### **IF NON-VEHICLE FUELING APPROVED BY MANAGER**

1. All flashers and strobes on and 5 mph speed limit while locating.
2. Position tank vehicle to prevent traffic from driving over the delivery hose and such that it does not obstruct emergency vehicle access roads.
3. Set brakes.
4. Confirm grade-Regular or Premium?
5. Leave tanker once all safety equipment is secure.
6. Inspect locations for storm drains.
7. **\*\*ALWAYS\*\*** place absorbent booms around item being fueled.
8. Check for electrical equipment located within 25 feet horizontally or 25 feet vertically of the dispensing nozzle

**\*\* Do not fuel if present and document in Slack channel \*\***

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9. Ensure the dispensing nozzle at all times is greater than 25 feet from buildings, property lot lines, public streets, public alleys, public ways, combustible storage, ignition sources, or members of the public.
10. Confirm item being fueled is shut off is applicable.
11. Keep vehicle flashers on during dispensing operations.
12. Set cones.
13. Inspect vehicle and surroundings for anomalies.
14. Set absorbent pillow under the nozzle and item to capture any spillover (yellow label towards tire).
15. Open fuel tank and cap.
16. Return to tanker to commence fueling operations.
17. Select associated Internal Valve (back/front) for product grade (premium/regular).  
**\*\* Assure other valve is closed to prevent fuel mixing \*\***
18. Confirm Emergency switch (2) are set to ON.
19. Visually confirm fuel grade to be selected by cross-check with magnetic stickers (fuel deck/Meter house).
20. Select Start TCS Meter (meter sets to zero).
21. Active Product List > Toggle Front & Back.
22. Select Start Twice to activate pump.
23. Wrap nozzle with absorbent pad.
24. Pull enough hose/no tension/lays on ground.
25. Keep fuel cap away from any hazard.
26. Bond the mobile fueling vehicle to the vehicle being fueled by using a UL listed hose and nozzle.
27. Start fueling and remain at fill point monitoring entire fill process.
28. Remove nozzle/no drips/absorbent pad.
29. Cap fuel tank/close fuel door.
30. Pick up absorbent pillow & storm drain cover if applicable.
31. Retract fuel hose.
32. Record fuel dispensed.
33. Turn pump off & close internal valve.
34. Close pump housing rollup doors.
35. Replace cones in designated holders/location.
36. Confirm gallons.
37. Enter gallons in Winston.
38. Seat belts on



# BOOSTER

## ABSORBENT RAG & DRIP PAD HANDLING

Effective 06.01.2018

### IN-USE STORAGE

#### 1. ABSORBENT RAGS

- a. In-use absorbent rags must be stored in sealed metal container labeled "In Use Absorbent Rags"
- b. Metal container located in Rear Passenger-Side compartment of each truck
- c. 1 absorbent rag may be kept wrapped around fuel nozzle while commencing operations on-site
  - i. \*\* Absorbent rag must be placed back in sealed metal container during transport off-site \*\*

#### 2. DRIP PAD

- a. In-use drip pad must be stored in Dog House between hose reel and interior wall

### HANDLING

#### 1. ABSORBENT RAGS

- a. Absorbent rags only to be used for wrapping nozzle when fueling
- b. In-use absorbent rags must remain in sealed metal container unless fueling on-site
- c. In-use absorbent rags must be transported back to Yard after each shift and remain with truck
- d. Report any absorbent rag that is soiled with a contaminant or excess fuel to a Manager for proper handling

#### 2. DRIP PAD

- a. Drip pad only to be used for placing on ground under nozzle while fueling
- b. In-use drip pad must remain in Dog House between hose reel and interior wall unless fueling on-site
- c. In-use drip pad must be transported back to Yard after each shift and remain with truck
- d. Report any drip pad that is soiled with a contaminant or excess fuel to a Manager for proper handling

**DISPOSAL**

**1. ABSORBENT RAGS**

- a. ONLY MANAGER MAY DISPOSE OF ABSORBENT RAGS
- b. In-use absorbent rags must be replaced every 2 weeks by Manager prior to becoming soiled with a contaminant or excess fuel
  - i. Manager must collect in-use absorbent rags from each truck every 2 weeks and place in sealed metal container for proper disposal
- c. If absorbent rag becomes soiled with contaminant or excess fuel before replaced, report to Manager for proper disposal
  - i. Manager must contact Environmental Logistics to pick up and haul soiled absorbent rag off-site

**2. DRIP PAD**

- a. ONLY MANAGER MAY DISPOSE OF DRIP PAD
- b. In-use drip pad must be replaced every 2 weeks by Manager prior to becoming soiled with a contaminant or excess fuel
  - i. Manager must collect in-use pad from each truck every 2 weeks and place in sealed metal container for proper disposal
- c. If absorbent pad becomes soiled with contaminant or excess fuel before replaced, report to Manager for proper disposal
  - i. Manager must contact Environmental Logistics to pick up and haul soiled absorbent pad off-site

**EXHIBIT C-Booster Driver Training Manual**

# **BOOSTER TRAINING OVERVIEW**

## Training Overview

### Part A: In house training

The below training occurs before new hire starts field training with the exception of those indicating\*\* Each will be checked off as completed.

- Tour and introductions
- Hazmat security awareness
- Hazmat transportation
- Issued and review Booster Workplace Health and Safety Program
- Issued and review Booster Safety and Compliance Program
- Issued and review Booster Operations Manual
- Fire extinguisher training program
- Spill prevention and containment training
- Issued and cover Emergency Response Guide
- Issued and cover FMCSA Handbook
- Get new hire set up with Slack, Wilson, email, Expensify, order credit card

### Part B: Field Training

The below is covered first day in field and repeated by trainer in following days until new hire can demonstrate ability to meet operating standards and requirements. Each is checked when new hire can successfully meet standards and requirements without assistance.

- Log in start time on Driver app
- Equipment introduction (cover all components) Ensure truck is clean and orderly.
- Ensure to show and explain safety equipment: fire extinguisher, spill kit contents, cones, chocks, etc
- Explain policy of truck and fuel tank locked at all times when unattended.  
Demonstrate how to lock and unlock fuel tank lock.
- Pre-trip inspection process (load DVIR app on new hire phone)
- Cover all glove compartment paperwork (registration, accident kit, etc)
- Cover Booster app (how a customer orders a fill) Have new hire set up his / her account
- Demonstrate how customer orders are received, customer order details, how to locate customer vehicle.
- Proceed to first fill order. Demonstrate / explain parking lot speed limit (5 mph)
- Demonstrate safety procedures when parking at customer car per Operations Manual. (cones, chocks, flashers, truck positioning, etc).

- Explain and ensure that there are no smokers within 50 Ft
- Service customer vehicle. Abide by Booster Operations Manual for fueling.
- Explain spill containment procedures per ERG and Booster Operations Manual
- Demonstrate input of fuel dispensed into app, order completion and Booster card
- Refueling. Abide by Booster Operations Manual for refueling tanks.
- End of day: explain parking procedures and restrictions. Demonstrate post trip inspection. Demonstrate locking fuel tank and truck. Log out on app

## In The Field

### Pre-Trip Overview

Daily Vehicle Pre-Departure Inspection Safety Checklist (Performed and tracked via Fleet.io software)

Complete a review of all the necessary pre-drive checks and adjustments prior to operating Booster vehicles each day:

Vehicle Number \_\_\_\_\_ Date \_\_\_\_\_

Check around and under the truck for objects or obstructions Y/N

Tires have air Y/N

All safety placards are in place: Y/N

1203 Flammable Liquid Placards on front, back and sides Y/N

No Smoking within 25 feet on back and sides Y/N

DOT number on sides Y/N

Visual inspection of tank, hose and connections for no leaks Y/N

Fuel pump switch on tank operates correctly Y/N

Emergency Fuel Shutoffs on both sides function properly Y/N

Warning Strobes function when activated Y/N

Hazmat Spill kit supplies are full Y/N

Cones and chock blocks and triangle reflectors are in bed of vehicle Y/N

Grounding cord on vehicles when hose is not grounded Y/N

Emergency Response Guide in cab Y/N

Adjust seat prior to moving vehicle. Position the seat to keep your head 18" from the airbag. Y/N

All safety belts are operational Y/N

Adjust the mirrors. Y/N

Adjust the head restraint. Position it directly behind the middle of your head. Y/N

Turning signals, lights, wipers breaks all operate correctly Y/N

Check ventilation. Adjust the heat, air conditioning or airflow before you start to drive.

Y/N

Employee Signature

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NO Answers must be discussed with supervisor prior to operating vehicle

### **Pre-Departure**

1. Conduct pre-trip checklist to ensure vehicle is in good working order and contains all necessary safety equipment (see equipment list in Booster Fuels - Safety and Compliance Program)
2. Sign into driver app when you are ready to begin the trip
3. Choose a Service Location in the Driver App and proceed to the location

### **Arrival at Service Location**

1. In the Driver App's map tab, locate the closest vehicle and proceed to it
2. Once you have located the vehicle, position the driver truck such that you minimize the number of cars blocked and are not impeding traffic
3. Turn truck off
4. Turn electricity switch in the truck's cab to the on position
5. Turn on strobe light switch
6. Put 2 chock blocks, one in front and one behind, each tire of the car
7. Look around the vehicle for drains. If there is a drain within 15 feet of the vehicle put socks down to prevent runoff into the drain in case of a spill.
8. Turn pump on by lifting lever on motor

### **Fueling Vehicle Prepare Tank for Fueling**

1. Open truck bed and pull pump and hose out of the reel
2. Reset meter to zero before pumping any gas

### **Pre-fueling safety procedure**

1. Mobile Phone is functional
2. All operators are trained and employed by Booster

3. The operation is not taking place on a public street
4. Locate storm drains, if located within 15 feet of operation deploy spill control socks
5. Engine of vehicle being fueled is shut off
6. Other ignition sources are not present, no smokers within 25 feet of vehicles
7. Fueling is a minimum of 25 feet away from buildings, combustible storage and property lines
8. Tank vehicle is positioned to preclude traffic from driving over the delivery hose
9. If nighttime, adequate lighting is present
10. Tank vehicle brakes are set
11. Chock Blocks are in place on tank vehicle
12. Warning strobes are operating
13. Place absorbent spill pad on ground below fueling operation

### **Begin Fueling**

1. Open fuel tank door
2. Insert the nozzle into the vehicle's fuel tank
3. Place absorbent spill pad under the hose nozzle
4. Use one hand to press the handle of the pump
5. Allow the pump to pump gas into the vehicle until the nozzle clicks and then stop pumping gas

### **End Fueling**

1. Take spill pad off the ground and hold under the nozzle
2. When removing the nozzle from the fuel door, pull the nozzle out and "pour" any remaining gasoline into the tank to minimize any spillage. "Catch" the end of the nozzle with the absorbent spill pad after it is removed from the tank to ensure no gas is spilled
3. Pull on the hose to activate the automatic winding of the hose back into the reel
4. Check the meter to determine how many gallons of fuel were pumped
5. Enter the number of gallons from the above calculation into the driver app and confirm
6. Remove chock blocks from tires and place in the back of the truck

# **BOOSTER TRAINING SCHEDULE**

# Driver Training

## Booster Training Overview

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### Day Activity

1. Introduce driver to team  
Start online training (Training)  
Evaluate student pace and split into two days if appropriate  
< Ride along with Veteran (if training is split) >  
Hand out Booster Policy & Training Guides (Training)  
Coordinate and confirm driver has or is in progress for logistics items (Logistics)  
Full day ride along with Veteran
  
2. < Spill training  
< Introduction to vehicle safety features  
< Introduction to driver app  
< Introduction to fueling operations  
< Introduction to navigating customer sites  
< Commence General field training  
< Manager process review  
Manager road test to confirm driving skills
  
3. Continue ride along training  
< Tanker  
< Driver difference training for all vehicle types  
< Manager process review
  
4. Full day ride along with Veteran #2  
< Continue training – progressive exposure  
< Driver app familiarization  
< Driver handling fueling operations  
< Driver navigating customer sites  
< Driver handling all aspects of fueling with Lead confirming aptitude level  
< Driver difference training for all vehicle types
  
5. Manager to review Driver progress with trainers  
< Adjust training to assure successful completion
  
6. Manager Final Check ride  
< Continue until driver has expected comfort and process quality level  
Release for general assignment

## Booster Training & Logistics

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Date	Training
_____	<i>Online</i> Defensive Driving for Light & Medium Duty Vehicles
_____	Driver Vehicle Inspections: The Complete Process
_____	Fire extinguisher use
_____	Hazmat: General Awareness
_____	Hazmat: Highway Transportation Driver Training
_____	Hazmat: Security Awareness & Safety
_____	<i>In-House</i>
_____	Issued and reviewed Booster Safety policy
_____	Internal sign-off
_____	Issued and reviewed Booster Standardized Work Task Cards
_____	Internal sign-off
_____	Cellular Phones and Driving Attachment 1
_____	Internal sign-off & training
_____	Spill prevention and containment training
_____	Internal sign-off & training
_____	Issued and reviewed Emergency Response Guide
_____	Manual sign-off
_____	Issued and reviewed FMCSA Handbook
_____	Manual sign-off
_____	Road test (Driving skills)
_____	Manager check ride
_____	<i>New hire logistics</i>
_____	Slack
_____	Winston
_____	Gmail
_____	Booster
_____	Expensify
_____	Credit card
_____	Fuel card > Pacific Pride (Western States Oil)
_____	Fuel card > CFN (Robinson Oil Customer Service)
_____	Add Emergency number on phone > Chemtrec
_____	Add Emergency number on phone > Crum & Forester

# Booster General Field Training

---

**Driver** \_\_\_\_\_  
**Trainer** \_\_\_\_\_

<b>Date</b>	<b>Training</b>	<b>Details</b>
_____	Equipment introduction	Cover all components Clean & orderly
_____	Safety equipment	Fire extinguisher; spill kit; cones; chocks; any other equipment
_____	Fuel security	Fuel tank locked when unattended Demonstrate lock/unlock steps
_____	Pre-trip inspection	Load driver app Demonstrate in driver app
_____	Paperwork	Review vehicle binder (Registration, accident kit, etc)
_____	Booster customer app	Driver to setup personal account Walk driver through features
_____	Booster driver app	Review features Views; map v list; locate vehicle; details
_____	Fill order overview	Demonstrate process; 5 mph @ customer sites Handout Fueling Task Sheet
_____	Safety procedures	Operations Manual Cones, chocks, flashers, truck position, etc
_____	Smoking proximity	50-foot minimum spacing Constant awareness for fire and spark sources
_____	Service vehicle	Follow policy and task sheet Observe and coach to meet Booster standards
_____	Spill containment	Review Booster procedures Review ERG
_____	Complete transaction	Input fuel tendered Review close out steps
_____	Refueling	Booster operations manual Review safety @ station and terminal locations
_____	End of day	Parking procedures and restrictions Post trip; locking fuel tanks & trucks; app log out; yard security

# Booster Vehicle-Specific Training

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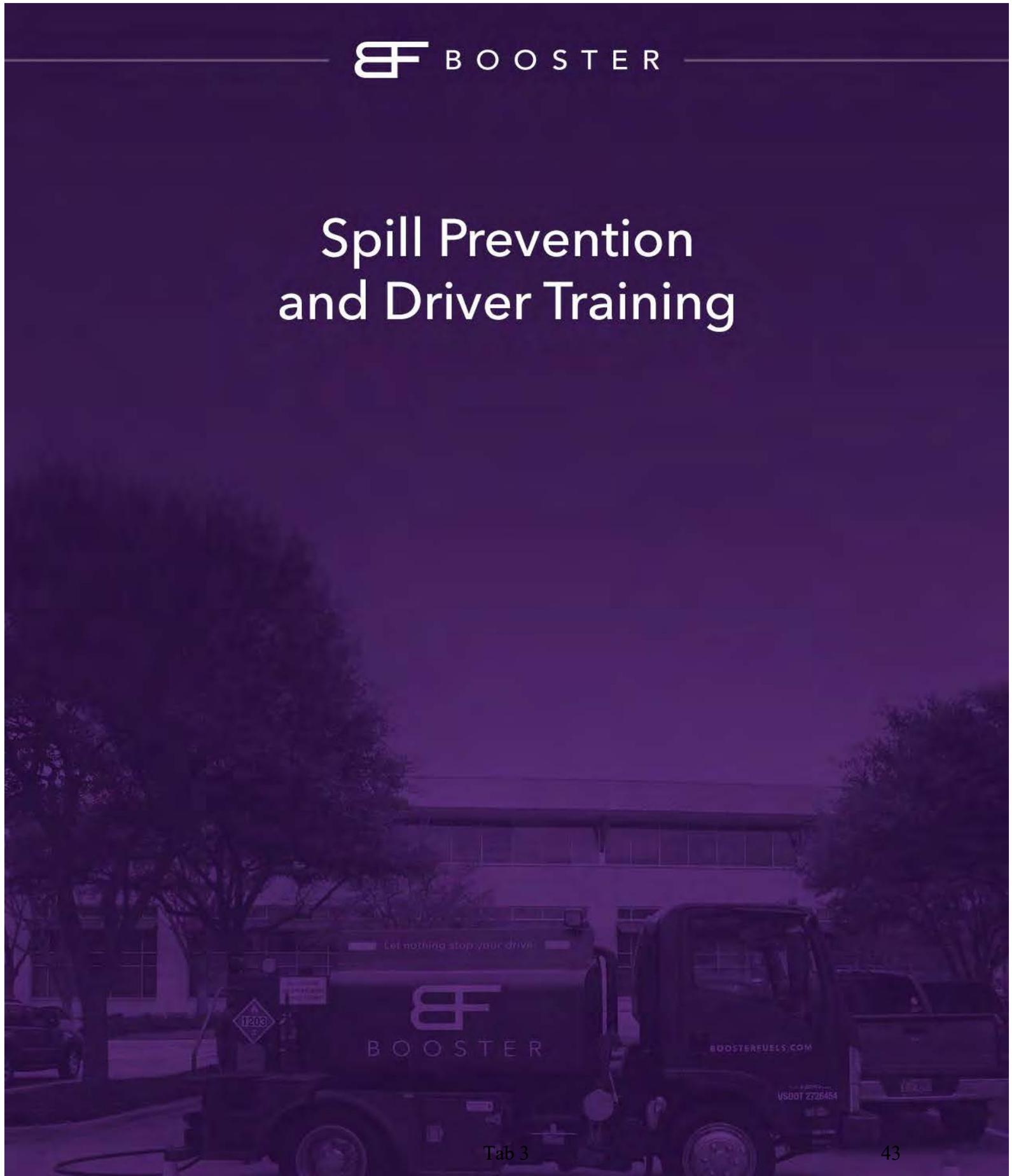
**Driver** \_\_\_\_\_  
**Trainer** \_\_\_\_\_

<b>Date</b>	<b>Training</b>	<b>Details</b>
_____	Southwest Dual Tanker	Pre-Trip differences SW task card review Road check
_____	Western Cascade	Pre-Trip differences SW task card review Road check
_____	Skymark Dual Tanker	Pre-Trip differences SW task card review Road check
_____	F-250 Single Tank	Pre-Trip differences SW task card review Road check
_____	F-250 Dual Tank	Pre-Trip differences SW task card review Road check

**EXHIBIT D-Booster Safety and Emergency Procedures**



# Spill Prevention and Driver Training



## Booster Fuels Record of Safe Operations

Booster Fuels launched in early 2015. We have pumped millions of gallons of gasoline and diesel safely in the San Francisco Bay Area without a reportable spill. Why?

**Booster meets or exceeds all applicable environmental, health, governmental, and safety regulations**

All drivers have CDLs with tank and hazmat certification.

All drivers and vehicles are DOT and NFPA compliant.

All drivers and employees are trained in spill prevention and accident mitigation.

Booster maintains all proper fire and spill mitigation supplies in its vehicles as mandated by law. And, Booster's refueling model reduces gasoline vapor emissions by **more than 40%** versus service stations.

**Booster Fuels is the Safer, Cleaner alternative.**

## Booster Spill Prevention & Control: “Not a drop.” Ever.

Booster Fuels Inc. believes that the protection of people, places and the environment is essential to operations. Every individual in the company has the ability to stop any process should they believe a spill could occur. Even small drips are not acceptable to Booster Fuels. Our slogan is “not a drop” and each driver keeps this in mind when they provide service to a customer.

We achieve our “not a drop” goal through extensive training of drivers on Booster Fuels’ operational procedures. “Not a drop” starts at the truck, where the driver grips the nozzle with an absorbent pad specifically designed to absorb gasoline. The driver carefully walks the nozzle to the customer’s car and places the absorbent pad underneath the nozzle when inserted into the car. The pad absorbs any potential drips that might occur during fueling. Booster’s processes also require service professionals to cover any storm drains within 25 feet of filling.

The following plan is on file with local fire departments (each plan has specific location-based details) as well our company Spill Prevention and Response Plan. All processes and procedures must be followed as outlined here. Failure to follow these procedures can result in disciplinary actions.

If you have any questions, please feel free to contact our Director of EH&S.

Tree Kiester  
Booster Fuels Inc.  
405.922.2295



## Spill Prevention & Emergency Response Plan

### **Emergency Contact Information**

Onsite Emergency Contacts:

**Celestin Tiffany** – Primary  
678.895.4861 24-Hour Phone

**Tree Kiester** – Secondary  
405.922.2295 24-Hour Phone

**Dave Sandifer** – Tertiary  
301.712.5974 24-Hour Phone

### **Emergency Response Contact(s)**

Fire/Paramedics/Police: 911  
National Response Center: (800) 424-8802  
Spill Contractor: *To be determined*

Safety Data Sheet– Driver binder

**BOOSTER FUELS, INC.**  
**CONFIDENTIAL BUSINESS INFORMATION & TRADE SECRET**

**DO NOT DISCLOSE**



BOOSTER

**NORTHERN CALIFORNIA EMERGENCY SPILL RESPONSE PROCEDURE**

<b>INTERNAL REPORTING</b>	<b>EXTERNAL CONTACTS</b>
Call the One Dial Number <b>First</b> – 669-242-5742 1. Night - Ben Demico - 408-427-6275 2. General Manager – Celestin Tiffany – 678-895-4861 3. Dave Sandifer - 301-712-5974 4. Tree Kiester – 405-922-2295 5. Frank Mycroft - 925-209-1847 (CALL TWICE/TEXT)	1. <b>CALL 9-1-1</b> 2. Call environmental remediation service (TBD)
<b>1. Step back and assess surroundings.</b>	
<p align="center"><b>Are you safe?</b> <b>Is the public safe?</b></p>	If <b>'NO'</b> - Get yourself and others to Safety - CALL 9-1-1 - Stop the flow (if able) - Follow INTERNAL REPORTING process - Initiate Spill Response
	If <b>'YES' - CONTAIN</b> the Spill - Stop the flow using pads and booms - Follow INTERNAL REPORTING process - Initiate Spill Response
<b>2. Stop the flow.</b>	
<ul style="list-style-type: none"> <li>- STOP the nozzle + secure it.</li> <li>- Trigger the EMERGENCY SHUTOFF switch, if you can safely reach it.</li> <li>- STOP the pump.</li> <li>- TURN OFF chassis engine / electrical</li> </ul>	Determine source of the spill/leak and stop it if it can be done safely. <ul style="list-style-type: none"> <li>- Cover a rupture in the hose with absorbent pad and apply pressure.</li> </ul>
<b>IF THERE ARE INJURIES, FIRE, OR FLOW CANNOT BE STOPPED:</b>	
<ul style="list-style-type: none"> <li>- Evacuate the immediate area, provide care to injured.</li> <li>- Use Fire Extinguisher with PASS technique, if able.</li> </ul>	
<b>3. Respond to the Spill</b>	
<b>Protect Yourself</b> <ul style="list-style-type: none"> <li>- Use personal protective equipment.</li> <li>- Eliminate sources of ignition.</li> </ul>	<b>CONTROL the Spill</b> <ul style="list-style-type: none"> <li>- Protect drains and manholes using absorbent, booms and covers.</li> </ul>
<b>Less than 5 Gallons - CLEAN UP</b>	<b>More than 5 Gallons - CONTAIN</b>
<ul style="list-style-type: none"> <li>- Apply absorbent pads to absorb gasoline.</li> <li>- Spread oil-dri around affected area.</li> <li>- Collect the contaminated sorbent using shovel/broom in bucket.</li> <li>- Secure waste bucket on truck and return to Yard for disposal.</li> </ul>	<ul style="list-style-type: none"> <li>- Use supplies to confine the spread of the gasoline.</li> <li>- Engage EXTERNAL CONTACTS for spill response.</li> <li>- Establish perimeter and keep people away until help arrives.</li> </ul>

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Spilled Gasoline from Customer Vehicle Checklist  
Specific Response Direction

**YOU HAVE THE AUTHORITY AT ANY TIME YOU DO NOT FEEL SAFE TO STOP AND CALL 9-1-1**

1. **Note** spilled gasoline
  - a. Stop filling
  - b. Place nozzle into holder in pump house
  - c. Ensure you do not step in the gasoline
2. **Contain** the spilled gasoline
  - a. Place all readily available pads from rump house in front of the spill flow
  - b. Use additional pads from spill kit as needed
  - c. When the spill is not getting any larger you have contained the spill
3. **Notify**
  - a. Once contained call Primary Contact (Celestin)
  - b. If unable to reach Primary Contact, call Secondary Contact (Tree)
  - c. Do not proceed until someone else in the company knows about the situation
4. **Protect**
  - a. Dismount the fire extinguisher and place on the ground upslope from the spill
  - b. Place caution tape around the spill area one car dimension in all directions
5. **Control** the spill
  - a. Obtain spill bucket
  - b. Place absorbent on top of the spill to a depth of ½ inch until spill is completely covered
  - c. Use shovel to broadcast absorbent under a car, if necessary
  - d. When spill is covered and is definitely not getting larger you have controlled the spill
6. **Evacuate** the situation to ensure everyone is safe
  - a. Stop all activity and step back to see the whole scene
  - b. Note any new challenges that were not seen before
7. **Notify** again
  - a. Call management again and await further direction
8. **Clean up** the spill – if directed
  - a. Place yellow plastic bag into the spill bucket to assist with filling
  - b. Scoop the absorbent from the spill area using the shovel and brooms
  - c. Fill the bag with all the absorbent and the contaminated pads
  - d. Use the zip ties to secure the bag
  - e. All contaminated material must go into the bucket before transport
9. **Restore** the area – if directed
  - a. Ensure all pads and absorbents are removed
  - b. Remove caution tape
  - c. Place the spill bucket into a compartment – NOT in the cab
10. **Return** to yard – if directed
  - a. You will have further direction from management by this time

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Spill Prevention

Hazardous Substance Management: All hazardous substances, including chemical wastes, are to be managed in a way that prevents release. The following general requirements are to be followed. They include:

**1. Container and Tank Management**

- All hazardous substance containers and tanks must be in good condition and compatible with the materials stored within.
- All hazardous substance containers and tanks must be accessible and spacing between them must provide sufficient access to perform periodic inspections and respond to releases.
- Any spills on the exterior of the container or tank must be cleaned immediately.
- Flammable materials stored or dispensed must be grounded to prevent static spark.

**2. Good Housekeeping**

- All hazardous substances must not be stored inside buildings or under cover;
- All hazardous substance containers should be closed while not in use;
- Use drip pans or other collection devices to contain drips or leaks from dispensing containers or equipment.
- Implement preventative maintenance activities to reduce the potential for release from equipment;
- Immediately clean up and properly manage all small spills or leaks;
- Periodically inspect equipment and hazardous substance storage areas to ensure leaks or spills are not occurring;
- Keep all work areas and hazardous substance storage areas clean and in good general condition.

**3. Marking/Labeling**

- Ensure all hazardous substances are properly marked and labeled in accordance with all federal, state and local regulations.

**4. Employee Training:** All employees must receive periodic training on the proper handling of hazardous substances; spill prevention practices, and emergency response procedures. Training must include a review of the spill prevention and emergency response plan, and a review of location and use of emergency response equipment. Training will be recorded through safety meeting training logs.

**5. Spill Response Equipment:** Spill response equipment must be maintained and located in areas where spills are likely to occur. Spill kits should provide adequate response capabilities to manage any anticipated spill or release. The following general requirements are to be followed: They include:

- Stock spill clean-up kits that are compatible with the hazardous substances stored on site;
- Spill kits are located in all vehicles where spills are likely to occur and locations where hazardous substance are being transferred;
- Spill kits are sized to manage an anticipated 5-gallon spill;
- Emergency response equipment is inspected daily to ensure that the spill kit is complete.

**6. Spill Response Supplies**

- Spill Bag contents
  - 20 each 15" x 20" fuel specific absorbent pads
  - 2 each 8" x 12" fuel specific absorbent booms
  - 1 roll caution tape
  - 1 each safety goggles
  - 1 pair protective gloves

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- 1 each hazardous waste containment bag
- Spill Bucket contents
  - 1 each 5 gallon bucket
  - 4 gallons absorbent granules
  - 2 each fuel-specific absorbent pads
  - 1 pair protective gloves
  - 1 each hazardous waste label
- Additional Spill Materials
  - 1 each short handle plastic shovel
  - 1 each small head corn broom
- Locations: Spill equipment Content/Inventory
  - Ford F-250: 5-gallon spill kit
  - Skymark Tanker: 5-gallon spill kit

## Emergency Response Plan

The Emergency Response Plan is a specific plan for dealing with emergencies and shall be implemented immediately whenever there is a fire, explosion, or release of a hazardous substance that threatens human health or the environment. The emergency response plan shall be reviewed and immediately amended whenever:

1. The plan fails in an emergency;
2. The delivery operation changes in its design, maintenance, or other circumstances in a way that increases the potential for fire, explosions, or release of a hazardous substance;
3. The list of emergency contacts change; or
4. The list of emergency equipment changes.

Response actions in the event of a spill or release: In the event of a hazardous substance spill or release, immediately take measures to keep the spill from entering sewer or storm drains, spreading off-site, or affecting human health. In all cases caution and common sense must be maintained with the primary goal being to prevent and/ or limit personal injury. Start with Safety - Isolation - Notification (SIN)

Then proceed with clean-up if:

1. The spilled material and its hazardous properties have been identified;
2. The spill is small and easily cleaned within 15 minutes;
3. The responder is aware of the chemicals' hazardous properties.

## Spill Cleanup Procedure

- Immediately remove 5 gallon spill kit and pour absorption in front of the release
- Ensure that you are wearing protective gloves and goggles
- Use the push broom to push absorbent over the spill and towards the release
- Apply more absorbent if needed
- Remove spill response duffel bag if needed
- Use broom and plastic shovel to clean up absorbent
- Spill pads and booms shall be put into a 5 gallon Hazardous Waste bag
- Place all contaminated material into the spill bucket
- Seal the bucket and await instructions from Booster Operation

If a spill or release cannot be easily controlled (such as under cars) or injuries have occurred due to the release, then following procedures must be implemented:

- Summon help and alert others of the release
- Evacuate immediate area;
- Call 9-1-1;
- Provide care to the injured;
- If potential fire or explosive hazards exist protect the hazard area from entry
- Respond defensively to any uncontrolled spills;
- Use appropriate personal protective equipment when responding to a spill
- Attempt to shut off the source of the spill if safe to do so;

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- Eliminate sources of ignition if safe to do so;
- Protect storm drains by using absorbent, booms or drain covers if safe to do so;
- Secure the area of the spill with the provided caution tape;
- Notify Booster emergency contact(s);
  - a. **Celestin Tiffany – Primary**
    - i. 678.895.4861 24-Hour Phone
  - b. **Tree Kiester – Secondary**
    - i. 405.922.2295 24-Hour Phone
  - c. **Dave Sandifer – Tertiary**
    - i. 301.721.5974 24-Hour Phone
- Booster will notify cleanup contractor Environmental Logistics [(888) 641-3940] to assist with the spill response and cleanup activities;
- Booster will notify the appropriate corporate entity at the location of the spill;
- Coordinate response activities with local emergency personnel (fire department);
- Be prepared to provide SDS information to fire department, EMT, hospital or physician;
- Booster will notify appropriate agency if a release has entered the environment.

## Evacuation Procedures

In the event of a hazardous substance release that has the potential for fire, explosion or other human health hazards the following procedures will be implemented:

- If the spill enters building air intakes Facility staff will be notified of evacuation by one or more of the following method(s): Verbal, Cell Phone, or Fire Alarm.
- Notification to emergency services will be performed – Call 9-1-1.
- Employees and staff will evacuate to locations away from the spill. Individuals responsible for coordinating evacuations must confirm if the business has been completely evacuated.
- Booster Fuels delivery staff will be made familiar with evacuation procedures during new customer or new hire training orientation, and annual trainings thereafter.
- Designated emergency response contacts will coordinate all activities with outside emergency personnel.

## Spill Cleanup and Disposal

In the event of a hazardous substance release spill cleanup materials are to be properly characterized by Booster Fuels Operations Manager to determine if it designates as a California State Dangerous Waste.

Reporting a Release:

If a hazardous substance has been released to soil, surface water, or drains leading to waterways the following notification (within 24-hours) must be performed:

National Response Center release of oil or fuel to storm drain leading to surface water.

When reporting a release prepare to provide the following information (use spill report form):

- Your name and telephone number;
- Exact address of the release or threatened release;
- Date, time, cause and type of incident (fire, air release, spill, etc.)

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- Material and quantity of the release, to the extent known;
- Current condition of the vehicle;
- Extent of injuries, if any; and
- Possible hazards to the public health and/or;
- Hazards to the environment beyond the facility

## Spill Kit Details

Booster Fuels Inc. uses PIG products, specifically the PIG Spill Kit in Camo Duffel Bag and the PIG oil-only absorbent mat pads. The spill kit includes PIG blue socks to stop spills from spreading, PIG mat for absorption, PIC repair putty plugs or patches for leaks and cracks, goggles and gloves, temporary disposal bags. We replace the absorption mat that is included in the kit with the oil-only absorption mat.

Please see the attached links for both products:

1. [Spill Kit](#)
2. [Absorption Mats](#)

**EXHIBIT E-Booster Maintenance Procedures**

**BOOSTER FUELS, INC.**  
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**DO NOT DISCLOSE**



Date: \_\_\_\_\_  
 Unit #: \_\_\_\_\_  
 Hours/Miles: \_\_\_\_\_  
 Technician: \_\_\_\_\_  
 Rep. Order #: \_\_\_\_\_

**Medium Duty Vehicle Inspection**

\*Preventive Maintenance is a requirement of the Federal Motor Carrier Safety Administration Sec. 396.3\*

	PMI-A - 30 Days
	PMI-B - 90 Days (B.I.T.) (includes all A items)
	PMI-F - Annual Inspection (365 Days)

Status  
 ✓ = OK  
 X = Unsatisfactory  
 N/A = Not Applicable

Check	Cab/Test Drive	PM Level	Status
1	While obtaining vehicle, look for signs of leakage underneath, engine, transmission, coolant, differential, hydraulic, etc.	A,F	
2	Check Engine Oil, Transmission Oil, Coolant and Hydraulic Oil levels	A	
3	Inspect all external lights, headlight High/Low beam, 4 way, Stop, Turn, Tail, strobe, spot, etc.	A,F	
4	Inspect vehicle registration, insurance card, tank inspection and permit dates	A,F	
5	Inspect all Warning Decals, Conspicuity tape, reflectors, fire extinguisher expiration date, etc.	A,F	
6	Check operation of dash gauges: DPF status, DEF level, ABS light, coolant level, battery, turn signals, etc.	A,F	
7	Test operation of heater, defroster and A/C	A	
8	Check for proper operation of windshield wiper and washer	A,F	
9	Inspect windshield, door glass and mirrors for clarity (no cracks or hazing)	A,F	
10	Apply/inspect parking brake, brake should hold under slight load	A,F	
11	Engage exhaust brake and ensure proper operation	A	
12	Check steering wheel play and response on test drive (.39 in - 1.97in)	A,F	
13	Test operation of back up alarm, camera and all other backing devices	A,F	
14	Note operation of speedometer and tachometer on test drive	A	
15	Check operation of start safety switch, starts only in Park or Neutral	A	
16	Inspect seat and seat belts for functionality and operation	A,F	
17	Inspect cab doors; check latches and hinges for proper operation	A	
18	Properly Lock Out/Tag Out Vehicle for remainder of inspection	A	
Check	Walk Around Inspection	PM Level	Status
19	Inspect entire vehicle for proper branding and decals, note any damage	A	
20	Inspect mirror assemblies for mounting and security	A,F	
21	Inspect body hold downs and mounting hardware	A,F	
22	Inspect condition of spill kit, warning triangles and FX	A,F	
23	Inspect fuel tank mounting, DEF tank mounting and respective lines	A	
24	Drain air tank and note moisture content	A	
25	Inspect chassis and body frame rails, note any cracks, loose mounting hardware or rust around bolt heads	A	
26	Inspect rear lights, reflectors and license plate for mounting and clarity	A,F	
27	Inspect mudflaps and mounting brackets	A	

**BOOSTER FUELS, INC.**  
**CONFIDENTIAL BUSINESS INFORMATION & TRADE SECRET**  
**DO NOT DISCLOSE**



Date: \_\_\_\_\_  
 Unit #: \_\_\_\_\_  
 Hours/Miles: \_\_\_\_\_  
 Technician: \_\_\_\_\_  
 Rep. Order #: \_\_\_\_\_

**Return To Service Inspection**

Status

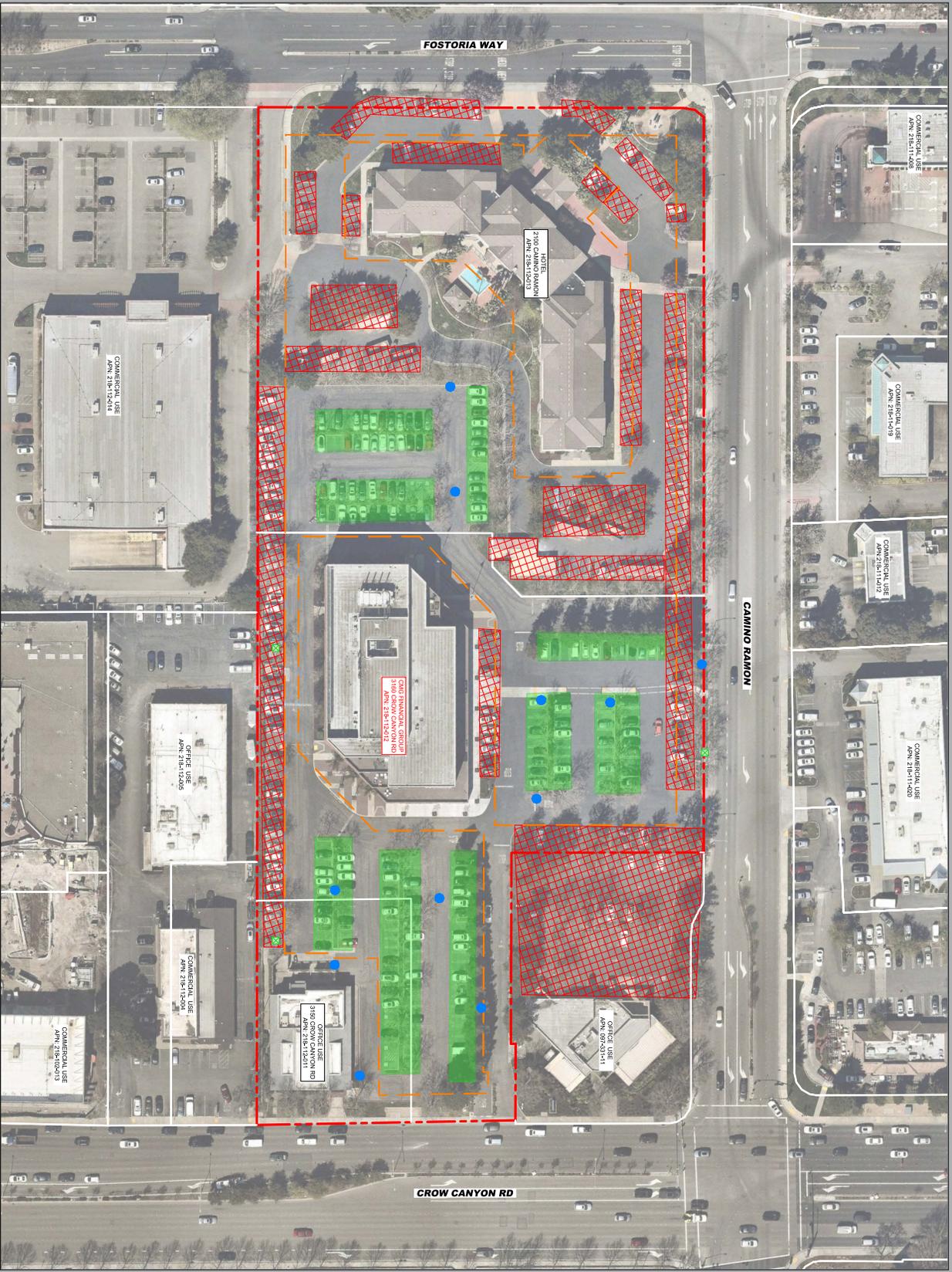
✓ = OK  
 X = Unsatisfactory  
 N/A = Not Applicable

Check	Cab/Test Drive	Status
1	While obtaining vehicle, look for signs of leakage underneath, engine, transmission, coolant, differential, hydraulic, etc.	
2	Check Engine Oil, Transmission Oil, Coolant and Hydraulic Oil levels	
3	Inspect all external lights, headlight High/Low beam, 4 way, Stop, Turn, Tail, strobe, spot, etc.	
4	Inspect vehicle registration, insurance card, tank inspection and permit dates	
5	Inspect all Warning Decals, Conspicuity tape, reflectors, fire extinguisher expiration date, etc.	
6	Check operation of dash gauges: DPF status, DEF level, ABS light, coolant level, battery, turn signals, etc.	
7	Test operation of heater, defroster and A/C	
8	Check for proper operation of windshield wiper and washer	
9	Inspect windshield, door glass and mirrors for clarity (no cracks or hazing)	
10	Apply/inspect parking brake, brake should hold under slight load	
11	Engage exhaust brake and ensure proper operation	
12	Check steering wheel play and response on test drive (.39 in - 1.97in)	
13	Test operation of back up alarm, camera and all other backing devices	
14	Note operation of speedometer and tachometer on test drive	
15	Check operation of start safety switch, starts only in Park or Neutral	
16	Inspect seat and seat belts for functionality and operation	
17	Inspect cab doors; check latches and hinges for proper operation	
18	Properly Lock Out/Tag Out Vehicle for remainder of inspection	
Check	Walk Around Inspection	Status
19	Inspect entire vehicle for proper branding and decals, note any damage	
20	Inspect mirror assemblies for mounting and security	
21	Inspect body hold downs and mounting hardware	
22	Inspect condition of spill kit, warning triangles and FX	
23	Inspect fuel tank mounting, DEF tank mounting and respective lines	
24	Drain air tank and note moisture content	
25	Inspect chassis and body frame rails, note any cracks, loose mounting hardware or rust around bolt heads	
26	Inspect rear lights, reflectors and license plate for mounting and clarity	
27	Inspect mudflaps and mounting brackets	

**EXHIBIT F-Site Map**

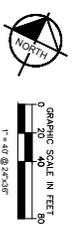
**CMG FINANCIAL CORP.**

**SAN RAMON, CALIFORNIA**



**CMG FINANCIAL CORP SITE PLAN**  
 2100 CROW CANYON ROAD APRN 218211-012

SAN RAMON, CALIFORNIA



- LEGEND**
- SITE BOUNDARY LINE
  - 25' SETBACK LINE
  - ASSUMED EMERGENCY ACCESS (E.A.A.)
  - NO FUELING AREA
  - BIOPETITION AREA (B.A.)
  - PROPOSED FUELING AREA
  - ELECTRIC VEHICLE CHARGING AREA (E.V.A.)
  - EXISTING DRAIN
  - EXISTING GENERATOR TRANSFORMER

- NOTES:**
1. ALL SITE IMPROVEMENTS SHOWN WERE PROVIDED BY BOOSTER FUELS, INC.
  2. ALL PLAN INFORMATION SHOWN IS CURRENT AS OF 04-25-2019 PER THE INFORMATION PROVIDED BY THE COUNTY OF CONTRA COSTA'S ENGINEERING DIVISION. THE USER SHALL BE RESPONSIBLE FOR VERIFYING THE INFORMATION SHOWN ON THIS PLAN.

**Kimley-Horn**

6200 KIMLEY-HORN ROAD, SUITE 100  
 PLACENTIA, CALIFORNIA 92669  
 PHONE: 951-961-7272  
 WWW.KIMLEY-HORN.COM

CMG FINANCIAL CORP	DRAWN BY: KMB	SCALE: 1"=40'
KH PROJECT: 19712001038	SHEET: 1 OF 1	DATE: 04/30/2019

**EXHIBIT G-Hose and Nozzle Specifications**

## Premium Low Permeation Hardwall Gasoline Pump Hose.

- Recommended anywhere a hardwall hose is required.
- Recommended for all gasoline and gasoline/ Ethanol blends at Ethanol levels designated as “gasohol” (E10 maximum or less), diesel fuel and diesel fuel/biodiesel blends with nominal biodiesel concentrations up to 5% (B0-B5), kerosene and fuel oil (heating oil), leaded and unleaded gasoline where low permeation ( $\leq 10\text{g/m}^2/\text{day}$ ) is required.
- Designed for durability, flexibility, and easy handling.
- Highly resistant to cuts, abrasions, sun and weather.
- Resists kinking and eliminates meter creep.
- Improves ozone and abrasion resistance while providing increased life.
- Improves draping and handling characteristics.
- Will not mark or scratch vehicle finishes.
- Hose material is private branded and UL Listed to UL 330 for low permeation.
- All curb pump hose assemblies are 100% pressure tested, inspected for electrical continuity and sample pull tested.

## Low Perm Hardwall Hoses

MODEL NO.	DESCRIPTION	SHIPPING WEIGHT LBS (KG)
<b>5/8" LP HOSES</b>		
CP10LP8.5	5/8" Low Perm Hardwall 8.5' Assembly Hose	3.8 (1.7)
CP10LP10	5/8" Low Perm Hardwall 10' Assembly Hose	4.7 (2.1)
<b>3/4" LP HOSES</b>		
CP12LP8.5	3/4" Low Perm Hardwall 8.5' Assembly Hose	3.8 (1.7)
CP12LP8.5SV	3/4" Low Perm Hardwall 8.5' Assembly Hose Swivel	4.2 (1.9)
CP12LP9	3/4" Low Perm Hardwall 9' Assembly Hose	4.2 (1.9)
CP12LP9SV	3/4" Low Perm Hardwall 9' Assembly Hose Swivel	4.7 (2.1)
<b>1" LP HOSES</b>		
CP16LP8	1" Low Perm Hardwall 8' Assembly Hose	6.4 (2.9)
CP16LP14	1" Low Perm Hardwall 14' Assembly Hose	9.6 (4.4)

## Construction

Tube	Black Nitrile
Cover	Black CPE (Chlorinated Polyethylene), wrap impression
Reinforcement	Multiple textile braids with dual static wire helix
Temperature Range	-40°F to +180°F (-40°C to +82°C)



WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov

**Husky**

GENERAL FUELING PRODUCTS

**EagleFlex® Low Perm Hardwall****Premium Low Permeation Hardwall Gasoline Pump Hose.****System Options****Available in these Sizes**

Size	ID		NOM OD		MAX WP		WEIGHT	
	MM	IN	MM	IN	PSI	MPA	LB/FT	KG/M
5/8"	16	1.03	26	1.03	150	1.03	0.37	0.55
3/4"	19	1.17	30	1.03	150	1.03	0.44	0.65
1"	25	1.45	37	1.03	150	1.03	0.59	0.88

**Couplings**

Permanent, external crimp, zinc plated steel couplings, fixed and swivel



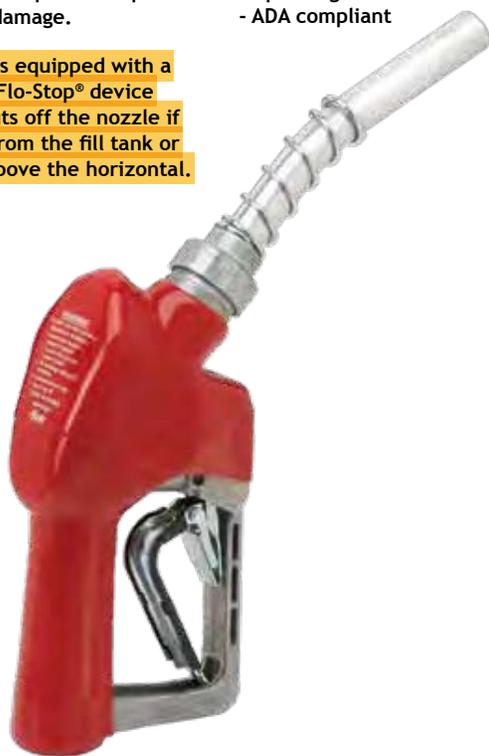
2325 Husky Way • Pacific, MO 63069  
 (800) 325-3558 • Fax (636) 825-7300  
[www.husky.com](http://www.husky.com) • [sales@husky.com](mailto:sales@husky.com)

MADE IN THE U.S.A.



## Pressure activated, automatic shut-off nozzle for full-service and self-service stations.

- XS<sup>®</sup> nozzle shuts off when:
  - the pump shuts off.
  - the gas tank is full.
  - the lever is opened before the pump is turned on.
  - the leak detector has not completed the test cycle.
- Stainless steel spout bushing keeps spout tip round and acts as a captive fastener to prevent tip-end sensor damage.
- Nozzle is equipped with a unique Flo-Stop<sup>®</sup> device that shuts off the nozzle if it falls from the fill tank or raises above the horizontal.
- StreamShaper<sup>®</sup> reduces turbulence for straighter fuel flow and less splash back spillage.
- Comes standard with smooth full grip guard.
- Optional EZ Lever:
  - two piece design cuts opening force in half
  - easier “to-the-penny” dispensing
  - ADA compliant



### Construction

Body	One piece die cast aluminum
Seals	Fluorocarbon
Packing	Double o-ring seal protected by fiber reinforced Teflon <sup>®</sup>
Lever	One piece contoured steel with hard plastic cover
Inlet	3/4" / 19.1 mm NPT



**WARNING: Cancer and Reproductive Harm—www.P65Warnings.ca.gov**

### New Unleaded Nozzles

MODEL	DESCRIPTION	SHIPPING WEIGHT LBS (KG)
159504	with Three Notch Hold Open Clip	3.1 (1.4)
E159504	with Three Notch Hold Open Clip	3.1 (1.4)
159508	w/o Hold Open Clip	3.1 (1.4)
E159508	with Hold Open Clip	3.1 (1.4)
159543	with Single Notch Hold Open Clip, Waffle Splash Guard and Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159544	with Three Notch Hold Open Clip, Waffle Splash Guard and Flo-Equalizer <sup>®</sup>	3.2 (1.4)
159554	with Three Notch Hold Open Clip and Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159558	w/o Hold Open Clip with Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159559	with Three Notch Hold Open Clip and Waffle Splash Guard	3.0 (1.3)
159566	w/o Hold Open Clip with Waffle Splash Guard	3.0 (1.3)
159575	w/o Hold Open Clip with 1807 Waffle Splash Guard	3.0 (1.3)
159576	with Three Notch Hold Open Clip and Waffle Splash Guard	3.0 (1.3)
159579	w/o Hold Open Clip with 1807 Waffle Splash Guard	3.0 (1.3)
159582	with Three Notch Hold Open Clip and Drip Less Spout	3.0 (1.3)
159589	with Single Notch Hold Open Clip, POPD <sup>®</sup> S and Waffle Splash Guard	3.0 (1.3)
159595	with Three Notch Hold Open Clip, POPD <sup>®</sup> S and Waffle Splash Guard	3.1 (1.4)
1302704	with Three Notch Hold Open Clip with GPR	3.1 (1.4)
1302708	w/o Hold Open Clip with GPR	3.1 (1.4)
1595106	with Two Notch Hold Open Clip	3.0 (1.3)
1595108	w/o Hold Open Clip, with POPD <sup>®</sup> S and Waffle Splash Guard	3.0 (1.3)
1595128	w/o Hold Open Clip and Spout Spring, with Waffle Splash Guard	3.0 (1.3)
1595131	w/o Hold Open Clip and Spout Spring, w/POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1595146	with Three Notch Hold Open Clip, POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1595179	with One Notch Hold Open Clip and Waffle Splash Guard	3.1 (1.4)
1595224	with Two Notch Hold Open Clip, Waffle Splash Guard and Flo-Equalizer <sup>®</sup>	3.1 (1.4)
1595232	with Single Notch Hold Open Clip, POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1120504	with Two Notch Hold Open Clip and EZ Lever	3.1 (1.4)
13027186	w/o Hold Open Clip and Spout Spring, with Waffle Splash Guard with GPR	3.0 (1.3)

### New Light Duty Diesel Nozzles

MODEL	DESCRIPTION	SHIPPING WEIGHT LBS (KG)
159503	with Three Notch Hold Open Clip	3.1 (1.4)
E159503	with Three Notch Hold Open Clip	3.1 (1.4)
159507	w/o Hold Open Clip	3.1 (1.4)
E159507	w/o Hold Open Clip	3.1 (1.4)
159545	with Three Notch Hold Open Clip, Waffle Splash Guard and Flo-Equalizer <sup>®</sup>	3.2 (1.4)
159553	with Three Notch Hold Open Clip and Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159557	w/o Hold Open Clip with Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159561	with Three Notch Hold Open Clip and Waffle Splash Guard	3.0 (1.3)
159567	w/o Hold Open Clip with Waffle Splash Guard	3.1 (1.4)
159577	with Single Notch Clip, POPD <sup>®</sup> and Waffle Splash Guard	3.3 (1.4)
159578	with Three Notch Hold Open Clip and Waffle Splash Guard	3.3 (1.4)
159580	w/o Hold Open Clip with 1807 Waffle Splash Guard	3.1 (1.4)
159585	with Single Notch Hold Open Clip, Waffle Splash Guard and Flo-Equalizer <sup>®</sup>	3.1 (1.4)
159596	with Three Notch Hold Open Clip, POPD <sup>®</sup> and Waffle Splash Guard	3.3 (1.4)
159597	with Single Notch Hold Open Clip and Waffle Splash Guard	3.1 (1.4)
1595109	w/o Hold Open Clip, with POPD <sup>®</sup> S and Waffle Splash Guard	3.1 (1.4)
1595122	with Three Notch Hold Open Clip, POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1595127	w/o Hold Open Clip and Spout Spring, w/POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1595130	w/o Hold Open Clip and Spout Spring, with Waffle Splash Guard	3.1 (1.4)
1595135	with Three Notch Hold Open Clip	3.1 (1.4)
1595225	with Two Notch Hold Open Clip and Waffle Splash Guard	3.1 (1.4)
1595233	with Single Notch Hold Open Clip, POPD <sup>®</sup> H and Waffle Splash Guard	3.1 (1.4)
1120503N <sup>*</sup>	with Two Notch Hold Open Clip and EZ Lever	3.1 (1.4)

<sup>\*</sup>Not Listed



Pressure activated, automatic shut-off nozzle for full-service and self-service stations.

## Dimensions and System Options

### Safe-T-Breaks<sup>®</sup>

MODEL NO.	DESCRIPTION
003360	¾" F x ¾" F NPT Reconnectable Safe-T-Break <sup>®</sup>
002273	¾" F x ¾" F NPT Non-Reconnectable Safe-T-Break <sup>®</sup>
006130	¾" F x ¾" F NPT Non-Reconnectable PCC Safe-T-Break <sup>®</sup>
005230	¾" F x ¾" F NPT Low Pull Reconnectable Safe-T-Break <sup>®</sup>

### Swivels

MODEL NO.	DESCRIPTION
000350	¾" M x ¾" F NPT Multi-Plane Swivel
000355	¾" M x ¾" F NPT Multi-Plane Swivel Anodized Black
002272	¾" M x ¾" F NPT 90° Pump Swivel
003895	¾" M x ¾" F NPT Inline Swivel
002950	¾" M x ¾" F NPT Multi-Plane Restricted Swivel

### Swivel/Safe-T-Break<sup>®</sup> Combos

MODEL NO.	DESCRIPTION
006310	¾" M NPT Multi-Plane Swivel connected to ¾" F NPT Reconnectable Safe-T-Break <sup>®</sup>

### Spouts

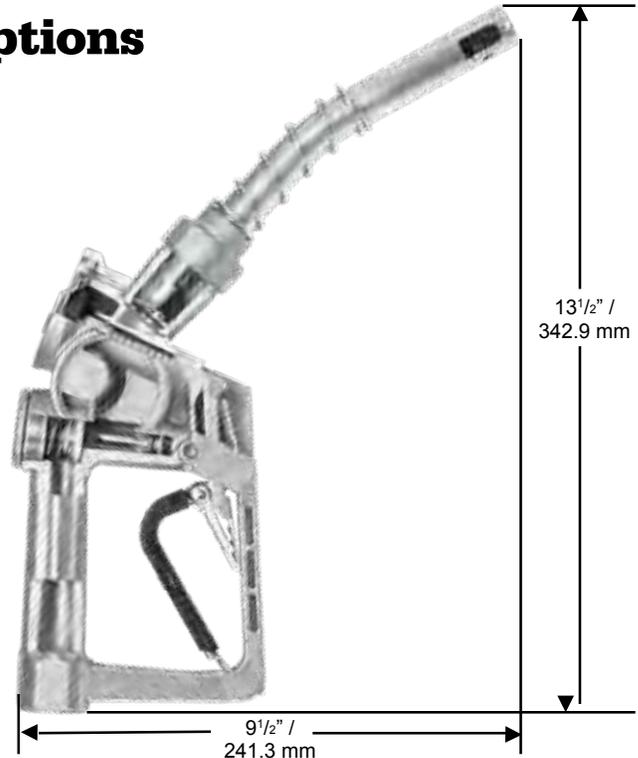
MODEL NO.	DESCRIPTION
001473	Unleaded Spout without Flo-Stop <sup>®</sup>
010434	Unleaded Long Spout without Flo-Stop <sup>®</sup>
001471	Light Duty Diesel Spout without Flo-Stop <sup>®</sup> with StreamShaper <sup>®</sup>
010353	Light Duty Diesel Long Spout without Flo-Stop <sup>®</sup>

### Pressure/Vacuum Vents

MODEL NO.	DESCRIPTION
004620	2" Slip-On Pressure Vacuum Vent
004885	2" Thread-On Pressure Vacuum Vent - NPT
005885	2" Thread-On Pressure Vacuum Vent with Internal Screen - NPT

### Accessories, Testing and Maintenance

MODEL NO.	DESCRIPTION
004490	Conventional Flo-Equalizer <sup>®</sup> - 10 gpm / 37.9 Lpm
003593	Hold Open Clip Kit
007490	Internal Flo-Equalizer <sup>®</sup> - 10 gpm / 37.9 Lpm
007089	Nozzle Service Kit
000397	Unleaded Spout Gauge



### Guards

MODEL NO.	DESCRIPTION
003376	Black Handle Guard
004145	Full Grip Guard
001806	Full Grip Reguard
005494	Lever Guard
003440	Mate Easy-on Package
003795	Mate Guard
008176	POPD <sup>®</sup> EZH Nozzle Guard
008175	POPD <sup>®</sup> EZS Nozzle Guard
007999	POPD <sup>®</sup> H Clear Cover
008185	POPD <sup>®</sup> H Full Grip Guard
008192	POPD <sup>®</sup> H Full Grip Reguard
008166	POPD <sup>®</sup> H Mate Guard
006628	POPD <sup>®</sup> S Clear Cover
006665	POPD <sup>®</sup> S Full Grip Guard
007205	POPD <sup>®</sup> S Full Grip Reguard
008165	POPD <sup>®</sup> S Mate Guard
001506	Protection Package
001809	Reguard Protection Package
001808	Waffle Splash Guard



2325 Husky Way • Pacific, MO 63069  
 (800) 325-3558 • Fax (636) 825-7300  
[www.husky.com](http://www.husky.com) • [sales@husky.com](mailto:sales@husky.com)

MADE IN THE U.S.A.



**EXHIBIT H-POW 66SB Swivel Breakaway**

## Materials

- Body:** Aluminum
- Sleeve:** Nylon, HDPE
- Seals:** Viton®
- Spring:** Stainless steel
- Poppet:** Aluminum
- Packed:** 20 per Case

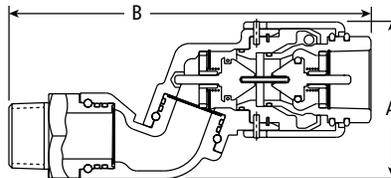


## Features

- ◆ UL and ULC listed for use in gasoline, diesel and up to 10% ethanol blends. Specific listings available at [www.opwglobal.com](http://www.opwglobal.com).
- ◆ Pull Force – the 66SB will break away with a pull force of no more than 350 lbs.
- ◆ Easily Reconnected at Waist Height – after relieving line pressure, simply push coupling halves together until latched. Reconnection force is approximately 15 lbs.
- ◆ Protected Coupling and Poppet – the breakaway's poppet and sealing surface are protected from impact during separation by a plastic sleeve.
- ◆ Reduces Connections – the single-unit design replaces the standard swivel, breakaway and whip hose, eliminating possible leak points.
- ◆ Double O-Ring Seal – both swivel joints are protected by a double O-Ring design.

### Design working pressure

- ◆ 50 psi (3.45 bar) maximum pressure.



## Ordering Specifications

Product #	Size	Weight	
		lbs.	kg
66SB-7575	3/4" x 3/4" (NPT)	1	0.45
66SB-1010	1" x 1" (NPT)	1.82	0.83

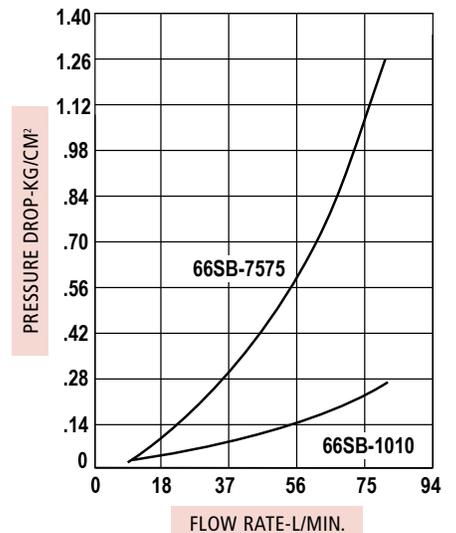
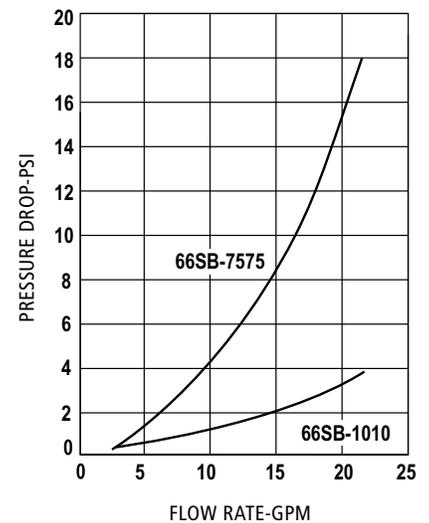
## Dimensions

Product #	A		B	
	in.	mm	in.	mm
66SB-7575	2 1/2"	64	5 29/32"	150
66SB-1010	3 1/32"	85	8 1/2"	216

66SB Instruction Sheet Order Number: **F-69**

## OPW 66SB Swivel Breakaway

The OPW 66SB Swivel Breakaway is intended for easy installation at the nozzle inlet. The compact, lightweight design incorporates a 360° swivel rotation at both the male end and middle joint, with a simple and easily-reconnectable breakaway on the opposite end.



Listings and Certifications 



### **EXHIBIT I-Shut-off Valve and Fuel Limit**

Attached are the relevant pages of the TCS 3000 Register, which describes the Fuel Limit Switch. The complete manual is available here: <http://powertransferproducts.com/wp-content/uploads/2014/11/TCS-3000-Set-Up-Operation-Manual.pdf>

**TOTAL  
CONTROL  
TCS SYSTEMS**

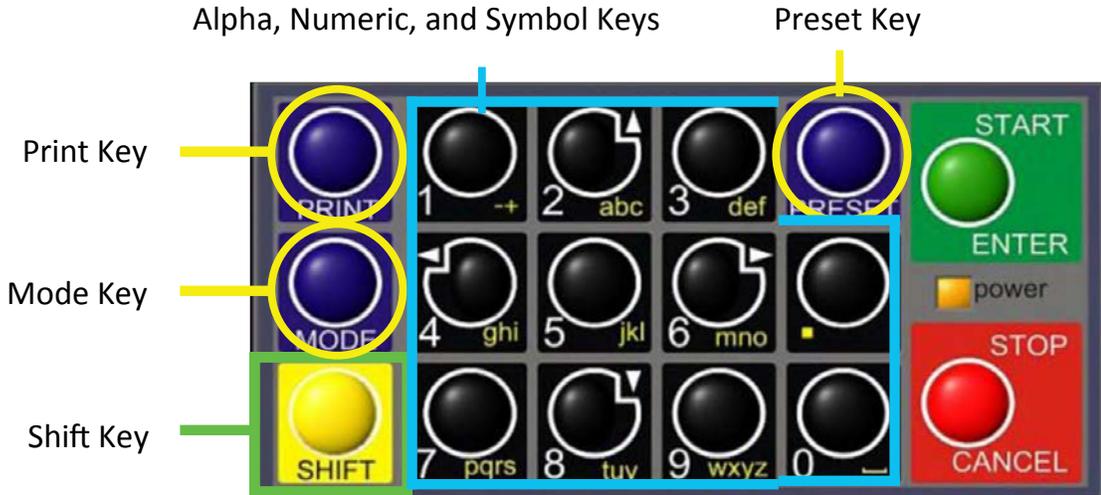
*"The Standard of Measurement"*

# TCS 3000 REGISTER



## Setup & Operation Manual

# Navigation Keyboard Functions (Continued)



**Preset Key**

- Alpha/Numeric Keys
- Mode Key
- Print Key
- Shift Key
- Shift & Mode

Allows you to PRESET the Price and Tax as well as Gallons into the Register.

Allow you to enter different prices, products, etc. into the Register.  
 MODE allows you to select different screens on the Register.  
 Allows you to print. You can print the delivery with or without selecting the STOP key.  
 Allows you to select the Alpha Keys on the Alpha/Numeric Keys. Selecting Shift allows you to use anything on the Key Pad in yellow.  
 Allows you to get into the main Menu screen.

## Display Icons

ICON	DESCRIPTION
	Printer with no ticket.
	No printer connection
	Printer ready with Ticket
	Valve not open
	Valve(s) open
	System Settings
	Weights & Measures
<b>AIR</b>	Air/Vapor Exhaust

---

Add Ticket Type	Create a NEW Customized Ticket, then press ENTER to name it. Copy from an Existing Ticket, then press ENTER to name it. <i>NOTE:</i> Any new ticket name must be 3 or more characters long
Remove Ticket Type	Select ticket to be removed from the system and press ENTER
Header Defaults	There are FIVE programmable fields for contact information or messages
Footer Defaults	There are FIVE programmable fields for contact information or messages
Shift Ticket Headers	There are FOUR programmable fields for contact information or messages
Inventory Tickets Header	There are FOUR programmable fields for contact information or messages

## **PRESET SETTINGS**

**Enable Preset** Utilizing the preset will request a preset amount before a delivery begins. After selection, press ENTER to complete setting.

Enable Preset	Enable or disable preset
Preset By Price	Enable or disable preset by Price
<b>Gross Preset</b>	<b>Enable or disable preset in GROSS VOLUME</b>
Net Preset	Enable or disable preset in NET CORRECTED VOLUME
Retain Preset	Enable or disable preset for repeat BATCH presets

## **MULTIPLE DELIVERIES**

Allows for the user to fill multiple tanks on one (1) single ticket transaction. Simply press and hold the SHIFT key down while pressing the START key to begin the multiple deliveries. If preset is enabled, each tank delivery will prompt the preset amount.

## **CUSTOMER ID OPTIONS**

The Customer ID Option will provide four (4) separate fields for the user to input prior to the delivery. The Customer Identification is normally used for Tank, Truck, Airplane Tail No., Locomotive, Driver, Customer, etc. Manual entry of data will be required through the alpha-numeric keypad. After selection, press ENTER to complete setting.

### Customer ID# (1-4)

Customer ID# Text	Field programmable for identification
Request ID#	Field requires user to enter an ID
Enforce ID#	Field requires user to enter an ID in order to operate the system
Validate ID#	Field validates the ID to ensure the ID is in the database, if invalid the system will be inoperable

## **DISPLAY PRECISION**

The unit precision can be displayed as a whole, tenth, hundredth or thousands measurement. After selection, press ENTER to complete setting.

1	Whole Unit
1.1	Tenth Unit
1.11	Hundredth Unit
1.111	Thousands Unit

**EXHIBIT J-Photo Of Approved Fire Extinguisher on a Booster Truck**



**EXHIBIT K-Memorandum from A. Klein re Bonding**



**TO:** Tyler Raugh

**FROM:** Andrew Klein, P.E.

**DATE:** November 15, 2018

**SUBJECT: BONDING OF MOBILE FUELING VEHICLE TO CUSTOMER VEHICLE DURING FUELING**

Our firm's services were requested to analyze the need of a discrete bonding wire between a mobile fueling vehicle and a customer vehicle during fueling. The purpose of electrically bonding the two vehicles is to equalize their electrical potentials to avoid the formation of a spark. The process of fuel moving through the hose and filling the gas tank of the customer vehicle produces static electricity, however experience indicates that fuel dispensing at rates below 25 gpm does not cause appreciable static generation. Continuous bonding during fueling dissipates any static to avoid buildup.

Listed fueling hose and nozzle assemblies, as required by the California Fire Code for the fueling of vehicles, are equipped to provide a continuous bond from the mobile fueling vehicle's fuel dispensing system to the customer fuel tank being filled. As long as the listed metal nozzle is in contact with the fuel filler neck in the customer vehicle being fueled, electrical potentials will be equalized prior to fueling, and any static buildup during the fueling operation will be immediately dissipated. This is the case whether the gas tank and fuel filler neck are metallic or constructed of static dissipative plastic. Both are designed conduct electricity at rates sufficient to dissipate static electricity and avoid buildup.

The use of listed hose and nozzle assemblies during fueling provides the necessary electrical bonding between the mobile fueling vehicle and the customer vehicle. The practice is in full compliance with the California Fire Code as well as national model codes and standards. Please do not hesitate to contact me with any questions at 509-380-5995.

Andrew S. Klein, P.E.

*Andrew S. Klein*

Fire Protection Engineer | Chemical Engineer  
President, **A S Klein Engineering, PLLC**



# THE FUTURE OF FUELING

Making Fuel Delivery Safer  
and More Sustainable



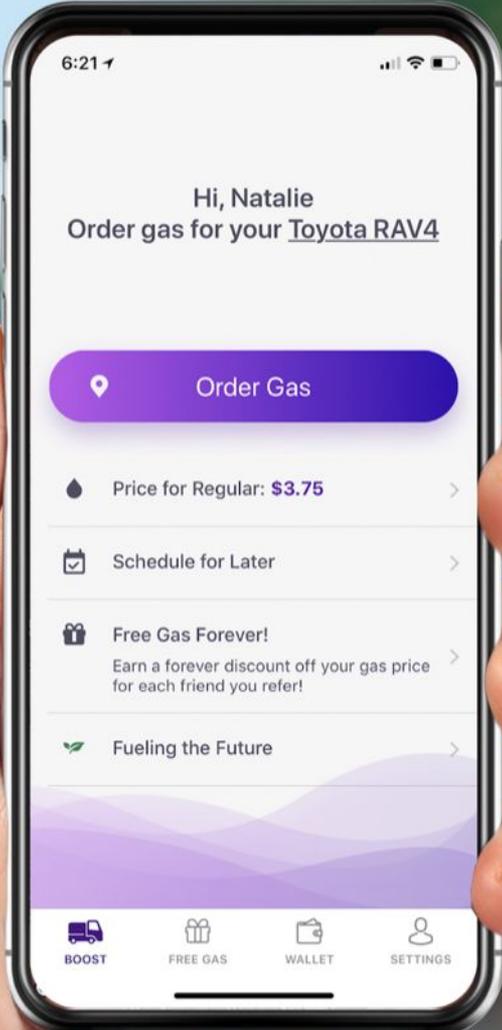
**Booster is irresistible**

**4.9**

★★★★★★

3840 App Store Reviews

Tab 3



75



**BOOSTER  
AT WORK**

# We are the popular new employee perk for Fortune 500 companies



facebook



Walmart



YAHOO!



ORACLE



ebay



Chegg

Michaels  
Where Creativity Happens

SIMON  
MALLS



intuit



GameStop  
POWER TO THE PLAYERS

jcpenny



Hewlett Packard  
Enterprise



Nationstar  
MORTGAGE



Qualcomm

cādence

JUNIPER  
NETWORKS



Tab 3





# BOOSTER FOR FLEET

# Fleet fueling is a critical pain point



*I had one driver gas up friends. He spent \$28,000 on our fuel card before we caught him.*



*Our drivers have had multiple accidents at gas stations. It is a high traffic and high risk location.*



*We are putting unnecessary miles and wear and tear on our vehicles detouring to get gas.*



*My drivers spend 20 minutes a day at the pump. That is \$10+ in labor spent pumping gas.*



*Drivers put gas into diesel all the time.*

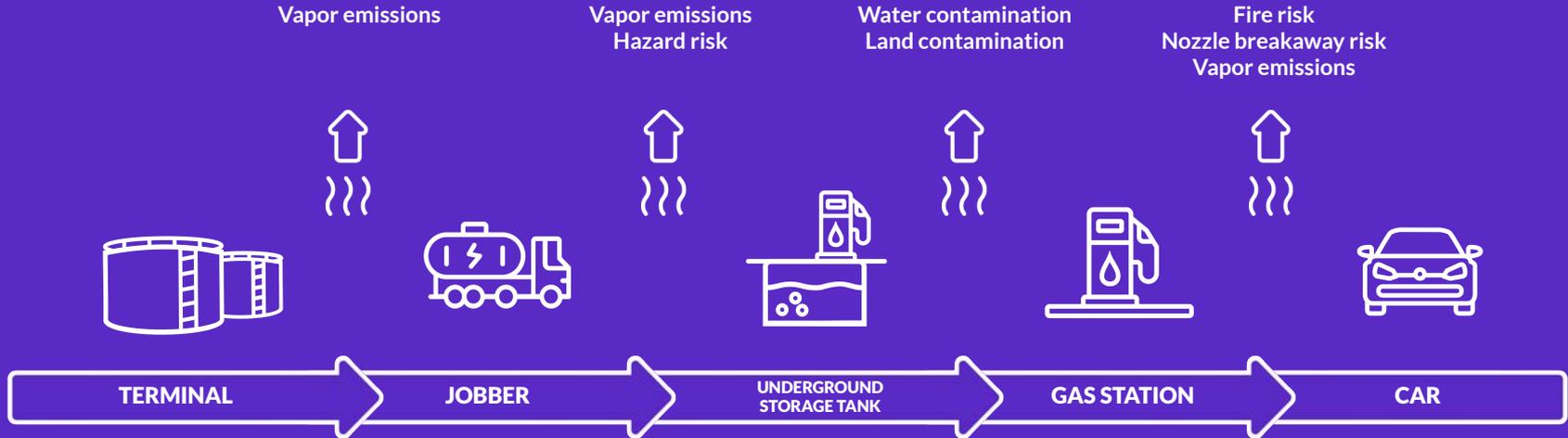
# We service customers across a wide range of industries





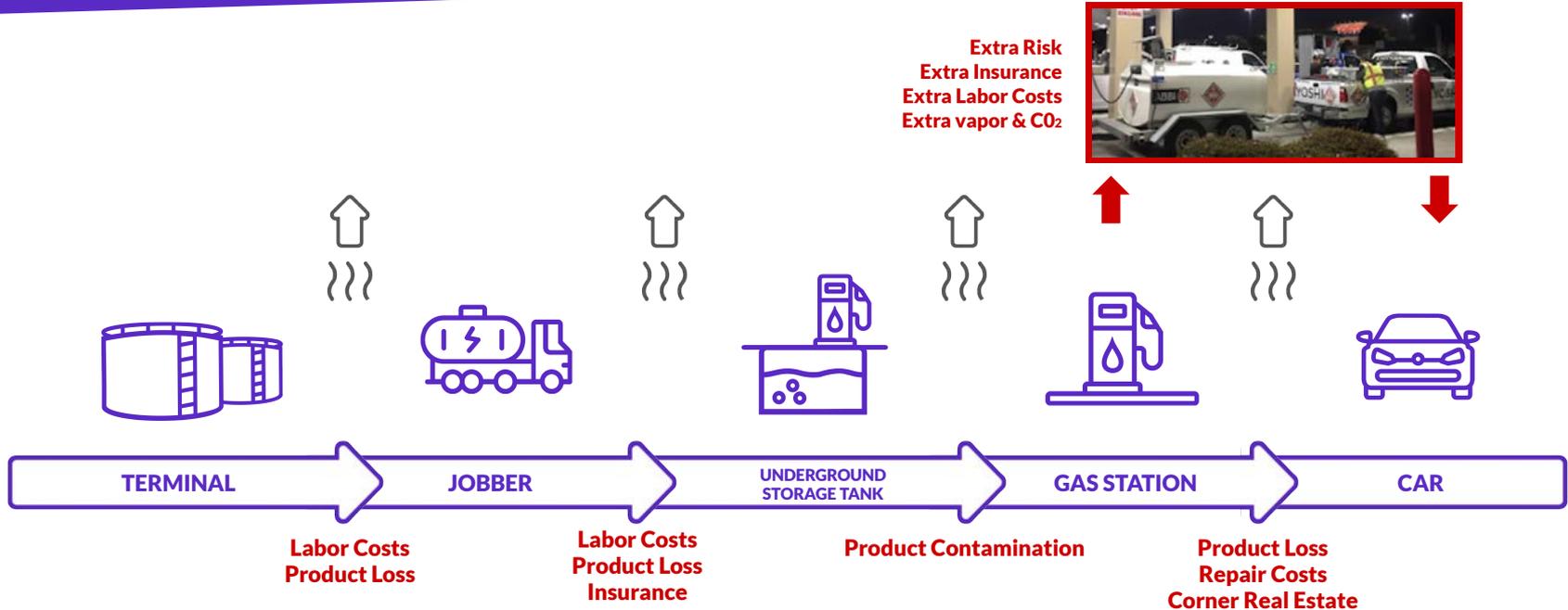
**BOOSTER IS SAFER  
& ECO FRIENDLY**

# We first eliminated the traditional fuel supply chain



## TRADITIONAL SUPPLY CHAIN

# We first eliminated the traditional fuel supply chain



## COMPETITOR SUPPLY CHAIN

# We first eliminated the traditional fuel supply chain

Fresher gas  
More cost effective  
40% less emissions

Compact  
Terminal-to-car  
Mobile & Smart



**BOOSTER FUELS SUPPLY CHAIN**



# Supporting Sustainability Intelligently: Los Angeles Case Study

Tab 3

# The potential to revolutionize fuel

The average car emits: **400g of CO<sub>2</sub> per mile**

A round-trip to the gas station takes the average driver: **1.5 miles out of their way**

**Annual benefits per vehicle using Booster exclusively:**

**60**  
vehicle miles  
traveled (VMT)  
eliminated

**52**  
pounds  
Of CO<sub>2</sub> eliminated

## If 1% of LA cars used Booster exclusively for one year:

**3.84**  
million  
VMT eliminated

**3.32**  
million  
Pounds of CO<sub>2</sub>  
eliminated

# Our secret weapon

Proprietary  
Gen9  
*Patent Pending*

Dispenses  
3x the rate  
of a gas station

Loads at  
600 gal/min.  
at the terminal

100+  
deliveries  
per load



Meets federal  
DOT, Weights &  
Measures, & Air  
Resources  
standards

Turning radius  
better than a  
Honda Civic

Cloud-connect  
ed table  
display with  
dynamic  
routing

Fits in any  
standard  
parking spot



# BOOSTER BENEFITS

# Safety & Compliance

Perfect track record of safety. Zero-drip policy based on fire hazmat safety measures.

## TRUSTED SERVICE PROFESSIONALS

Every service professional is a full-time employee, who undergoes a thorough background check, completes rigorous safety training, and carries a CDL with Hazmat/Tanker endorsements.

## END-TO-END INSURANCE

Our comprehensive commercial auto and pollution insurance comes with \$10 million liability coverage

## SAFETY OPERATIONS

We meet or exceed all requirements for NFPA-30A, IFC, FMCSA, CFR and International Fire Code® for on-demand mobile fueling.

## LICENSE FUEL RETAILER

We meet or exceed all DOT, EPA and air quality requirements for the safe transport, storage and dispensing of fuel.

## GREENEST REFUELING SOLUTION

Booster tanker are fully carbon offset, leaving zero footprint, and they are clean air idle certified.

## ECO NOZZLES

High quality fuel is dispensed via and Eco Nozzle that shuts off the fuel before the spout is out of the tank. Booster helped implement the Eco Nozzle by assisting in CA state testing.

## CERTIFIED WEIGHTS + MEASURES

Our meters meet advanced certification requirements of the NIST to guarantee safety and the accurate dispensing of fuel volumes.

## THE BOOSTER TANKER

We use a blend of hardware, software and ai/machine learning to build the most sophisticated fleet of tankers used today by thousands of customers for reliable, on-time gas deliveries.



**BOOSTER™**

**Thank you!**





# BOOSTER MAKES FUEL MORE ACCESSIBLE

“ People with disabilities may find it difficult or impossible to use the controls, hose, or nozzle of a self-serve gas pump. As a result, at stations that offer both self and full service, people with disabilities might have no choice but to purchase the more expensive gas from a full-serve pump. At locations with only self-serve pumps, they might be unable to purchase gas at all. ”

SOURCE: ADA.gov/gasserve

“ One of the reasons that New Jersey still has only full service gas stations is due, at least in part, to “heavy opposition to self-pumping... especially among subgroups such as women and the elderly.” ”

SOURCE: Ashley Koning, director of the Eagleton Center for Public Interest Polling at Rutgers University, Daily Princetonian, Feb. 14, 2018

“ Without accessible pumps, drivers with a disability would either have to pay more at the full-serve pumps where available or not be able to buy gas at all at fully self-serve stations. ”

SOURCE: Hank Falstad, AccessAdvocates.com, May 2015

# WE DELIVER ★★★★★ SERVICE TO DIFFERENTLY-ABLED CUSTOMERS



**Kyle** Jan 2

By the way you guys rock!! Thanks to all the guys out there making it happen. My wife which also use you guys, is most thankful as am I. We have special needs child in a wheelchair, you guys makes our lives so much easier and are a blessing for us!! If you guys ever need anything from us let us know. And of course we have highly recommended you guys to all of our work associates. Please let everyone know how much they are making a difference in our lives!!



National Spinal Association

We are honored to partner with @boosterfuels to help bring mobile fueling services to people with disabilities across the country.



Mobile Fueling is More Than Just a Convenience



**Uli** June 20

Great service as I really hate gas stations and filling up myself because I am in a wheelchair.

Score of 10/10



**Annette** Oct 10th

I have a disability and it is so helpful that someone can deliver my gas and other services.

Score of 10/10





# BOOSTER HELPS REPLACE UNDERGROUND STORAGE TANKS

543,812

Number of confirmed UST leaks since 1984.<sup>1</sup>

\$135K-\$275K

Average cost range of leakage remediation.<sup>3</sup>

44,000

Approximate number of leaking underground storage tanks discovered in California since 1984.<sup>2</sup>

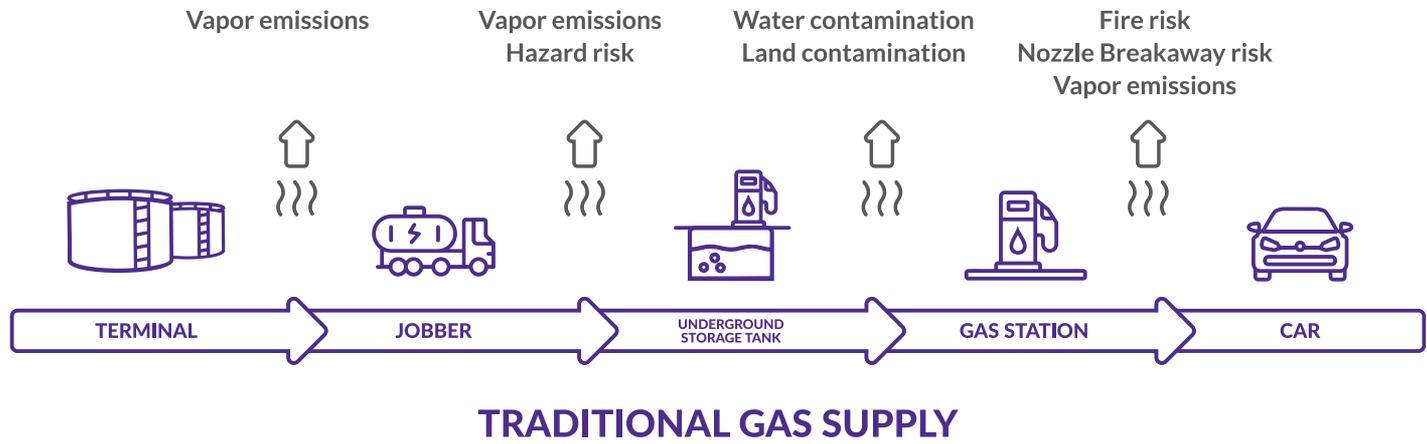
381

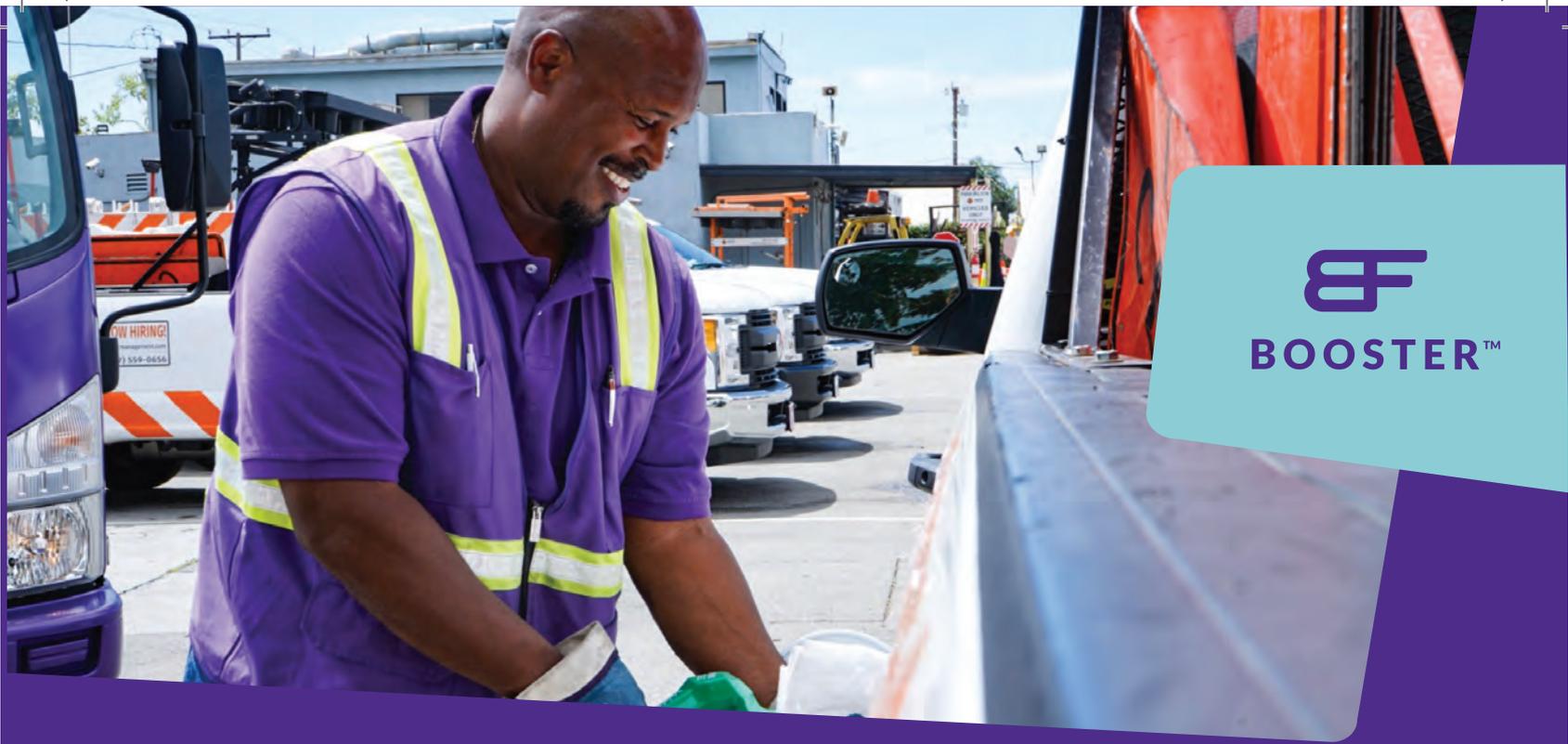
Number of underground storage tanks in California requiring remediation between 2013-2017 due to leaks.

# 0 Underground storage tanks relied upon by Booster.

1. EPA's UST Program Facts, August 2019  
2. OC Register Report  
3. EPA Underground Storage Tank Program News Release

# WE FIRST ELIMINATED THE TRADITIONAL FUEL SUPPLY CHAIN





# OUR SERVICE PROFESSIONALS

**At Booster, we know that it is not only the quality of the fuel, but also the quality of the people delivering it, that make Booster the safest, most convenient way to get fuel.**

**Our drivers are all employees with full health benefits and ownership equity in the company.**

They are all required to hold valid Commercial Driver's Licenses with Tanker and Hazardous Materials endorsements, as well as at least one full year of commercial driving experience. Booster also conducts a thorough training

process that includes vehicle inspection, safe driving, fueling best practices, and fire and spill prevention training.

All drivers must undergo and pass a thorough national background check that includes a global watchlist check and county criminal search – which provides a complete, more up to date profile report and database check.



# PERMITTED JURISDICTIONS



## CALIFORNIA

- ★ Burlingame
- ★ El Segundo
- ★ Foster City
- ★ Fremont
- ★ Livermore
- ★ Menlo Park
- ★ Millbrae
- ★ Milpitas
- ★ Mountain View
- ★ Newport Beach
- ★ Oakland
- ★ Orange County
- ★ Palo Alto
- ★ Pleasanton
- ★ Redwood City
- ★ San Jose
- ★ San Francisco
- ★ San Mateo
- ★ San Ramon
- ★ Santa Clara (City)
- ★ Santa Clara (County)
- ★ South San Francisco
- ★ Sunnyvale

## TEXAS

- ★ Austin
- ★ Carrollton
- ★ Coppell
- ★ Farmer's Branch
- ★ Fort Worth
- ★ Frisco
- ★ Grapevine
- ★ Hurst
- ★ Irving
- ★ Plano

## MARYLAND

- ★ Beltsville
- ★ Brandywine
- ★ Brentwood
- ★ Capitol Heights
- ★ Clinton
- ★ Greenbelt
- ★ Landover
- ★ Rockville
- ★ Temple Hills
- ★ Upper Marlboro

## WASHINGTON

- ★ Auburn
- ★ Des Moines
- ★ Everett
- ★ Lakewood
- ★ Marysville
- ★ Mukilteo
- ★ Seattle

## TENNESSEE

- ★ Nashville



# OUR SAFETY TEAM

Booster has assembled a team of safety experts to ensure not only that Booster is the easiest way to get fuel, it is also the safest. In fact, our team is comprised of **TWO MILITARY VETERANS** and a **FORMER PROSECUTOR**.



**JOSEPH OKPAKU**  
Chief Policy Officer

Former Assistant District Attorney

Joseph began his career as an Assistant District Attorney in the New York County ("Manhattan") District Attorney's Office where he prosecuted cases ranging from domestic violence incidents to home burglaries to medicaid fraud. He also spent several years policing Wall Street as a Trial Counsel in the NYSE's Division of Enforcement.

Prior to joining Booster, he helped Lyft navigate through early policy and safety matters, including issues relating to insurance, driver background checks, and general regulatory accountability.



**DAVE SANDIFER**  
VP, Operations

Eight years in the Marine Corps

Dave brings 16 years of leadership and operations experience from Amazon, the United States Marine Corps and ExxonMobil to his role as VP of Operations at Booster Fuels.

Dave began his career at ExxonMobil, where he was a Technical Support Analyst supporting Exxon and Mobil gas stations across the country. Prior to joining Booster, Dave worked at Amazon. Some of his most interesting work was growing and building the operations around the earliest Amazon Robotics Fulfillment Centers. Dave helped scale the robotics fulfillment network from two buildings to 16 before departing for Booster Fuels.

Additionally, Dave spent 8 years in the Marine Corps, where he served as an infantryman, Scout Sniper, Chief of Security at Camp David, and Scout Sniper Platoon Leader. Dave completed three combat tours during his service in the Marine Corps, including assignments in both Iraq and Afghanistan.



**DAVID ESPINOZA**  
Director, Fleet & Equipment

Four years in the U.S. Army

David brings 35 years of maintenance experience, including 20+ years of fleet management expertise, to Booster's operations. David has decades of work ensuring the safe, responsible operation of vehicular fleets. He is a former and current leader in industry associations and holds multiple training certifications, including Certified Automotive Fleet Manager (CAFM) training, former member of the American Trucking Association (ATA) Technology & Maintenance Council (TMC), and a current member of the National Association of Fleet Administrators (NAFA).

David also served for over 4 years in the U.S. Army, where he reached the rank of Sergeant, serving as Motor Sergeant over one of the largest supply and service companies in USAREUR (US Army Europe). His duties included overseeing the repairs and maintenance to over 250 vehicles, including fueling equipment, water purification units, generators and other mission critical support equipment.



**MICHAEL "TREE" KIESTER**  
Director, Environmental Health & Safety

Former U.S. Air Force civil servant

Tree Kiester began his career as a roustabout in the oil fields of southern Oklahoma. After college, Tree began his career as a U.S. civil servant working for the Department of the Air Force. While working for the U.S. Air Force, he focused on occupational safety and health, weapons safety and nuclear surety. He was the contracting Environmental Health and Safety (EHS) officer and subject matter expert for countless acquisitions, ranging from \$10K to in excess of \$10B. He investigated industrial and aviation related accidents exceeding \$1M.

After civil service, Tree worked in oil and gas as an EHS professional, focusing on contractor safety, protocol development and training. Prior to joining Booster Fuels, Tree worked for Amazon in the customer fulfillment organization, ultimately managing the EHS performance of two buildings with footprints in excess of 2M square feet and over 4000 employees at their peaks. He has been on the Oklahoma Advisory Committee for Motorcycle safety. Tree is also a Board Certified Safety Professional and has a Master's in Industrial Technology.

# TIRE INFLATION: SAFETY, COST & EMISSIONS



## TIRES & SAFETY

### MONTHLY

is how often the National Highway Traffic & Safety Administration (NHTSA) recommends that tire inflation levels be checked.

### 80% OF DRIVERS

don't know how to properly check tire pressure.<sup>1</sup>

### ~660 FATALITIES & 33,000 INJURIES

occur every year due to low tire inflation.

## TIRES & EMISSIONS

### 16.5 MILLION

extra tons of carbon dioxide are resulting from under-inflated tires.<sup>2</sup>

### 75M GALLONS OF FUEL & 900 METRIC TONS OF CO<sub>2</sub>

how much The California Air Resources Board estimates the state could save if every car in California had properly inflated tires.

## TIRES & FUEL COSTS

### 1PSI

The amount your tire pressure has to be off for your gas mileage to drop 3%.<sup>3</sup>

### 144

The extra gallons of gas you use every year when driving on under-inflated tires.<sup>4</sup>

### \$300-500

The additional fuel cost every year from driving on under-inflated tires.<sup>5</sup>

### BOOSTER TIRE INFLATION PROGRAM:

Our service professionals are an extra set of eyes and ears on each vehicle they service. They provide tire and inflation checks upon customer request. Tires are filled to vehicle manufacturer specifications and checked for visible damage, nails or contusions.

1. Rubber Manufacturers Association

2. Based on a study by the Minnesota Pollution Control agency that found 40% of cars in the state driving on improperly inflated tires which resulted in an extra 306,306,000 tons of carbon dioxide per year, and extrapolate that number to the 270 million cars on the road throughout the US.

3-5. Fueleconomy.gov



# OUR COMMITMENT TO SAFETY

- ★ Meets federal DOT, EPA, Weights & Measures, and Air Resources standards.
- ★ Our trucks are designed and constructed so that the tank cannot be overfilled. The quantity of fuel cannot exceed 95 percent of the tank's liquid capacity (FMCSA, 49 CFR 393.67).
- ★ Impact guards that meet Federal Motor Vehicle Safety Standard No. 223 requirements (49 CFR 571.223).
- ★ Fusion-welded, pressure-tested tanks with thermal protection sufficient to resist a pool fire for 100 minutes a torch fire for 30 minutes (49 CFR 179.100-3, 179.100-18 & 179.18).
- ★ Overturn spill protection (NFPA 385).

## INSPECTIONS: Our trucks undergo eight different regular, rigorous inspections, including:

- ★ A daily post-trip inspection for any day that the trucks are driven.
- ★ A 78-point inspection every 30 days.
- ★ An 85-point BIT inspection every 90 days which includes brakes, steering, suspension, tires and wheels.
- ★ Annual multi-level third party, DOT inspection.



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# FP112.5-18

**Proponents:** Linda Hale (Linda.Hale@Loudoun.gov); Andrew Milliken (amilliken@staffordcountyva.gov)

## 2015 Virginia Statewide Prevention Fire Code

**Revise as follows:**

**112.5 Application for appeal.** The owner of a structure, the owner's agent or any other person involved in the maintenance of the structure, or activity, or any person who may suffer an adverse health and safety or economic impact on his/her property, structure or business as the direct result of a decision of the fire official concerning the application of the SFPC or the official's refusal to grant a modification under Section 106.5, may appeal a decision of the fire official concerning the application of the SFPC or the fire official's refusal to grant modification under Section 106.5 to the provisions of the SFPC.

The appeal shall first lie to the *LBFFCA* and then to the *State Review Board* except that appeals concerning the application of the SFPC or refusal to grant modifications by the *State Fire Marshal* shall be made directly to the *State Review Board*. The appeal shall be submitted to the *LBFFCA* within 14 calendar days of the application of the SFPC.

The application shall contain the name and address of the owner of the structure and the person appealing if not the owner. A copy of the written decision of the fire official shall be submitted along with the application for appeal and *maintained* as part of the record. The application shall be stamped or otherwise marked by the *LBFFCA* to indicate the date received. Failure to submit an application for appeal within the time limit established by this section shall constitute acceptance of the fire official's decision.

**Note:** In accordance with § 27-98 of the Code of Virginia, any local fire code may provide for an appeal to a local board of appeals. If no local board of appeals exists, the *State Review Board* shall hear appeals of any local fire code violation.

**Reason Statement:** As written the application for appeal is limited to structures. The SFPC permits and enforces fire and life safety activities outside of a structure. For example, blasting, fireworks, and open burning. The application for appeal as written does not indicate who may challenge a decision by the fire official in any of these permitted actions. Case in point, an aerial firework permit in a residential community. Does a homeowner within 50 feet of a fire work venue have standing to appeal the code enforcement decisions of the Fire Official? As written they may not. I do not believe that was the intention of this section. The IFC does not limit who an appellant may be except to state that it must be a claim that the intent of this code or the rules legally adopted hereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equivalent method of protection of safety is proposed. The SFPC is too restrictive in this case. "Standing" is a legal term used in connection with lawsuits and a requirement of Article III of the United States Constitution. In simple terms, courts use "standing" to ask, "Does this party have a 'dog in this fight?'" Standing limits participation in lawsuits and asks whether the person(s) bringing a lawsuit, or defending one, has enough cause to "stand" before the court and advocate, since not anyone can go to court for any reason. To have standing, a party must show an "injury in fact" or in this case a potential injury in fact to their own legal interests. If the party cannot show the potential harm, the party does not have standing and is not the right party to be appearing before the court.

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

**Resiliency Impact Statement:** This proposal will increase Resiliency

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## Workgroup Recommendation

**Workgroup 1 - Final Committee Action:** Non-Consensus

**Workgroup 1 - Final Reason:**

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## Public Comments for: FP112.5-18

**Discussion by W Shaun Pharr**

Aug 10, 2020 23:13 UTC

AOBA/VAMA support the intent of the code change proposal. The range of actions taken by fire officials, from which an affected individual or entity may wish to appeal, are not limited to structures. The current code language does not reflect this practical reality and may, thus, discourage someone from seeking an appeal when they may be entitled to one. However, I have some concerns about whether the language of the code change proposal can be validly adopted to achieve its purpose.

As I pointed out in work group discussions, of the multiple Code of Virginia sections (Secs. 27-98, 36-98.2, 36-105(A), 36-114) which concern appeals from building and fire code decisions, only one section specifically speaks to standing-- Sec. 36-105(A) provides that "**Any person aggrieved by**" (emphasis added) a code official's application of the code, or refusal to grant a modification, may appeal to the local appeals board. As Kenney Payne notes in his comment, the TRB, on which I also serve, has received guidance from the Attorney General's office on multiple occasions as to the applicability and meaning of "aggrieved person" to TRB and other administrative appeals in the Commonwealth.

To me, this raises questions regarding current code provisions regarding building code and fire prevention code appeals, as well as about the current code change proposal,

First, the language regarding standing to appeal building code actions reads differently than the language regarding standing to appeal fire prevention code decisions. UBC 119.5 tracks directly the language from the Code of Virginia ("any person aggrieved by... may appeal"). Current SFPC 112.5 reads "The owner of a structure, the owner's agent or any other person involved in the maintenance of the structure, or activity may appeal the decision of the fire official..." As noted above, the Code of Virginia provision authorizing appeals of SFPC decisions does not contain any language defining standing to bring such an appeal.

Thus, the language currently found in SFPC 112.5 was, at some point, constructed "from whole cloth," without a statutory reference. The questions, then, are:

1. If the Code of Virginia is silent regarding who has standing to appeal an SFPC decision, is there a statutory basis for current SFPC 112.5, or for code change proposal 112.5-18?
2. What is/would be the statutory authority for adopting "standing" language for appeals from SFPC decisions that is substantively different than the language prescribing standing to appeal from UBC decisions?
3. What is the significance, if any, of the fact that both types of appeals ultimately go to the Statewide Technical Review Board-- but the TRB is generally obliged to follow the "aggrieved person" standard, as articulated by the Courts of Virginia?
4. What is the significance, if any, of the fact that Code of Virginia Sec. 36-97 defines "Building Code" as "the Uniform Statewide Building Code, as adopted and promulgated by the Board..." and the "USBC" has historically been understood to mean all USBC titles, including those of the SFPC?

I do not purport to have the answers to these questions. I raise them because, in my judgment as an attorney and TRB member, they are implicated by both this code change proposal and current code provisions regarding SFPC appeals. I urge DHCD staff to ask that they be addressed and answered by the Attorney General's office in order that the BHCD can make a reasoned and lawful decision on this code change proposal-- the intent of which, again, I support.

**Discussion by Kenney Payne**

Apr 17, 2020 19:51 UTC

Does this comport with the Code of Virginia. It is very limited as to who can file an appeal - must be "aggrieved." If it does not comport with the COV, then we would OPPOSE. If it does, then NO POSITION.

**Comment by Kenney Payne**

Aug 4, 2020 13:34 UTC

Not speaking for the Technical Review Board (TRB) but just sharing that numerous cases we hear revolve around the concept of being "aggrieved" and comporting such language to the Code of Virginia and legal case law. IN that respect, revising the language that basically "opens it up" to other possibilities could lead to further confusion and potential legal implications. So, while we applaud the effort and would like to see such terms expanded, we must voice our concern w/o some legal back-up - and on those grounds would OPPOSE this proposal.

**Comment by Linda Hale**

May 20, 2020 17:22 UTC

This expands who may appeal a decision, and provides relief to many situations that currently do not comport with the COV such as blasting, open burning and firework shows. So from that stance it is more compliant and goes farther to meet the spirit and intent of the COV than what is currently written. It does not limit anyone that may currently appeal in the current regulation

**Comment by Linda Hale**

May 20, 2020 17:12 UTC

SUMMARY  
DHCD WORKGROUP 1 MEETING  
2018 Code Change Cycle

June 23, 2020 at 9:30 a.m.  
Virtual - Adobe Connect  
<https://vadhcd.adobeconnect.com/workgroup/>

**FP112.5** Application for appeal.

**Proponent:** Linda Hale, Loudoun County Fire Department

**Comments:**

- Mr. Pharr (AOBA/VAMA) supports the intent of the code change, but doesn't think there is a statutory basis for expanding or altering this change. He mentions that there is no language regarding "standing" until much later in the summation. He supports revising this statement with recognition of the VCC.
- Mr. Witt (VBCOA) is concerned about the overreach that may result in this code change, and whether those who enforce code have the right to do what the passage describes.
- Mr. Payne (AIA Virginia) also raises concerns about distance from a homeowner via number of feet to a fireworks stand. He worries about the word "aggrieved" and that AIA Virginia cannot support as written.
- Mr. Milliken (FSB) summarizes that the Fire Services Board is willing to sign off on it with the language amended.
- Ms. Hale takes these semantic concerns into account and suggests the AG take a look at it, with respect to what the TRB would advise.
- Mr. Pharr discusses the interpretation of "aggrieved" in the context of different examples. Semantically he does not support due to the legal language being unspecific, but he supports the spirit of the code change.
- Mr. Allen (Henrico County) would like to clarify the difference between standing and status.
- Ms. Hale is in support of carrying over to August.

**Results:** Carry over to August meeting; support of the intent, just need to finesse language.

SUMMARY  
COMBINED WORKGROUP1, 2, 3 and 4 MEETING  
2018 Code Change Cycle

August 11, 2020 at 9:30 a.m.

Remote Meeting Link

<https://vadhcd.adobeconnect.com/workgroup/>

**FP112.5 Application for appeal**

**Proponent(s):** Linda Hale, Loudoun County Fire (Linda.Hale@Loudoun.gov); Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** This proposal seeks to clarify who can file appeals for decisions made by the Fire Official.

**Comments:**

- Ms. Hale provides context for this proposal.
- Mr. Pharr supports the intent, but he is concerned about the statutory authority and thinks it needs further clarification.
- Ms. Davis gives voice to a conversation she had recently with the assistant AG who says there is no statutory issue, but that he is concerned that this may be more of a zoning issue, and may be hard to enforce.
- Mr. Witt has issues with the language. He believes it is too broad and is seeking more specific definitions for pieces like “economic impact” and “adverse effects.”
- Mr. Dyer (SFMO) is in support.

Results: Non-Consensus

## FP103.2.1 (VFSB SFPC Edit Part 4)-18

**Proponents:** Andrew Milliken (amilliken@staffordcountyva.gov); SFPC Edit Workgroup

**Reason Statement:** This proposal includes items that were reviewed and decided on by the SFPC Edit Workgroup at their 7/30/20 and 8/20/20 SWG meetings, as well as items that were reviewed and decided on at the 9/1/20 Workgroup 2 (Combined WG) meeting. Proposal initially approved by Workgroup 2 on 8/11/20 (items from the 7/30 Fire Code Edit WG meeting).

Proposal Reapproved by Workgroup 2 on 9/1/20 (items from 8/20 Fire Code Edit WG meeting were added)

9/1 Workgroup 2 approval included all items that were reviewed and decided on at the 9/1/20 Workgroup 2 (Combined WG) meeting

**Resiliency Impact Statement:** This proposal will increase Resiliency  
This group of proposals will increase resiliency.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
This proposal is not related to construction.

**See attached for specific proposals**

	C	E	F	G
	WG REC	WG AMENDMENTS/MODIFICATIONS	VFSB PROPOSAL	VFSB REASON/COMMENTS
1			304.1.2 Vegetation. Weeds, grass, vines or other growth that is capable of being ignited and endangering property, shall be cut down and removed by the owner or occupant of the premises. Vegetation clearance requirements in urban-wildland interface areas shall be in accordance with the International Wildland-Urban Interface Code.	Restores reference to vegetation clearance requirements in the WUIC. This does not adopt all of the WUIC regulations but rather only those related to vegetation setbacks/clearance. The WUIC has been and continues to be referenced by Virginia codes in other books. Including this portion of the international WUIC guidelines is strongly supported by the Virginia Department of Forestry for Firewise communities. These are not construction requirements and is not covered by the Property Maintenance Code.
11	NC		603.3.2.7 Tanks in basements. Unless otherwise approved by the applicable building code, tanks in basements shall be located not more than two stories below grade plane.	Restores a key prohibition about tanks more than two stories below grade. This section restricts tanks more than two stories below grade because the further an incident is below grade, the greater challenge for the fire department to mitigate it. This is consistent with the control area approach in the VCC which also limits control areas to two levels below grade yet provides an exception for special approved conditions.
35	NC			
108	NC		901.5.1 Occupancy. In buildings where a fire protection system is required by this code or the applicable building code, it shall be unlawful to occupy any portion of a building or structure until the fire protection system installation has been tested and approved, except as provided in Section 106.	Provides added enforcement to areas that are illegally occupied prior to completion of fire protection systems. Similar to Chapter 33. Consider adding "by the Building Official" before the exception.
			905.5.3 Class II system. Each rack for 1-1/2 inch (38 mm) or smaller hose shall be provided with a label that includes the wording "FIRE HOSE FOR USE BY TRAINED PERSONNEL" and operating instructions. A minimum 1-inch (25 mm) hose shall be allowed to be used for hose stations in light-hazard occupancies where investigated and listed for this service and where approved by the fire code official.	Adds signage for consistency at occupant use hoses.
121	NC			
130	NC		907.4.2.3 Color. Unless otherwise approved by the applicable building code, manual fire alarm boxes shall be maintained red in color.	Restores the consistent requirement for manual pull stations to be red. Throughout the USBC, manual fire alarm boxes have been required to be red.
			912.2 Location. With respect to hydrants, driveways, buildings and landscaping, fire department connections shall remain located in accordance with the applicable building code so that fire apparatus and hose connected to supply the system will not obstruct access to the buildings for other fire apparatus.	Clarifies that the applicable building code regulates the location of FDCs and that they should not be moved without approval. Also provides context about not obstructing access roads with hoses. This section specifies that the FDC must be located so that vehicles and hose lines will not interfere with access to the building for the use of other fire department apparatus. The location of potential connected hose lines to the FDC and hydrants must continue to be preplanned with the fire department. Since fireground operations are based on local operational procedures, it is only reasonable that the fire chief of the jurisdiction have approval authority over access to the FDC.  Landscaping can also be a hindrance to fire department operations. Even where the FDC is visible, the extensive use of landscaping may make access difficult. Landscaping also changes over time. What may not have been an obstruction when it was planted can sometimes grow into an obstruction over time.
163	NC			
			912.2.1 Visible location. Fire department connections shall remain 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 code official and in accordance with the applicable building code.	Combines requirements outlined in 912.2.1 and 912.2.2 of the IFC. FDCs must be readily visible and easily accessed. While the intent is clearly understandable, its application can vary widely. Landscaping is often used to hide the FDCs from the public. This can greatly hamper the efforts of the fire department in staging operations and supplying water to the fire protection systems. Landscaping must be designed so that it does not obstruct the visibility of the FDC. Since fireground operations are based on local operational procedures, it is only reasonable that the fire chief of the jurisdiction have final approval authority over the visibility of and access to the FDC.
164	NC			
			1031.11 Emergency supplemental hardware. Emergency supplemental hardware shall be installed in accordance with the applicable building code and shall be maintained in accordance with this code and the manufacturer's instructions. The fire code official shall be authorized to revoke the use and storage of emergency supplemental hardware within a building for due cause including the failure to comply with requirements in this code or the applicable building code.	Combines the approved language for emergency supplemental hardware along with the authority granted to the fire official to revoke the storage or use as noted in the VCC.
280	NC			

See attached for summary excerpts for these sections.

## Excerpts from Combined Workgroup 1-4 on September 1, 2020 for Non-consensus SFPC Edit Proposals

### 304.1.2 Vegetation

- Mr. Witt doesn't believe we need some of this language and would prefer that the last sentence be removed from the proposal.
- Mr. Milliken maintains that the Wild Land Urban Interface Code is a referenced standard but does not apply to each state, including Virginia.
- Ms. Hale mentions that it does not have anything to do with building codes; that it refers strictly to vegetation.
- Mr. Farrell mentions that it may be helpful to pull out specific sections from the national code and adopt all of it and add it to the SFPC, as opposed to selectively enforcing based on what is required in Virginia. He suggests we move the pieces that are relevant to Virginia and add them to the SFPC.
- Mr. Witt is concerned that certain vegetation – like pine trees, certain bushes, and so on –will not be allowed to remain next to one's buildings. He thinks this may be an overreach, and encourages Mr. Milliken to push this toward the next code cycle so they can collectively examine the potential ramifications of this proposed change.
- Ms. Davis mentions how the Wild Land Urban Interface Code references only lots that have been designated by the locality as being within a Wild Land Urban Interface area as being required to submit a vegetation plan. She further indicated that this code had been considered for adoption by the BHCD previously and that proposal was disapproved. Mr. Milliken maintains that things have changed and that the Wildfire Risk would be the key element for consideration for this code cycle.
- Mr. Milliken cites 304.1.2 Vegetation: Weeds, grass, vines, or other growth that is capable of being ignited and endangering property shall be cut down and removed by the owner or occupant of the premises. Vegetation clearance requirements in wildfire risk areas shall be in accordance with section 603.1 through 607.2 and Appendix C of the International Wildland-Urban Interface Code.

Result: Non-Consensus

### 603.3.2.7 Tanks in Basements

- Mr. Farrell has some concerns with this one and will not revoke his opposition.

Result: Non-Consensus

### 901.5.1 Occupancy

- Mr. Witt suggests this one be considered Non-Consensus.
- Mr. Farrell questions why. Mr. Witt argues that because the authority regarding occupancy is a building officials' responsibility, and that it does not fall to a fire official.

Result: Non-Consensus

### **905.5.3 Class II System**

- Previous workgroup discussions included terminology, including “fire hose for use by trained personnel”. This proposal attempts to add the language in order to clarify who can utilize the fire hoses in which context.
- Mr. Farrell argues that Class II specifically regards occupants. Mr. Milliken states that the exact proposed language already exists in the current NFPA.

Result: Non-Consensus

### **907.4.2.3 Color**

- Mr. Pharr and Mr. Farrell voice concerns (Mr. Farrell has had issues with the “unless the applicable building code” language for several code cycles). Mr. Farrell is concerned this is headed for a “slippery slope” that recent code cycles have leaned on the language of “unless required by the applicable building code”.
- Mr. Pharr brings up the idea of the wall being red – would it apply then?
- Mr. Witt and Mr. Pharr both echo Mr. Farrell’s concerns; believes this could be incorrectly applied as a retrofit requirement
- Mr. Payne posits: if his alarm box is green, and the code language here outlines that the box should be red, would he be out of compliance?

Result: Non-Consensus

### **912.2 Location**

Result: Non-Consensus

#### **912.2.1 Visible Location**

Result: Non-Consensus

### **1031.11 Emergency Supplemental Hardware**

- Mr. Payne wishes to know if the word “maintenance” includes storage, since the second sentence of the proposal indicates how the materials are to be stored. He worries the second sentence may be used to circumvent the first sentence.
- Mr. Witt has concerns about this being maintained in the applicable building code. He disagrees with Mr. Milliken.

- Mr. Payne backs Mr. Witt’s assessment. He is opposed if this proposal expands upon what was already agreed upon; AIA Virginia is in support if the proposal is intended to be carried out as was previously discussed.
- Mr. Farrell comments that building officials have the authority to revoke or suspend COO according to the VCC, so he is not sure this is the proper way to explain this.
- Mr. Milliken claims that these items were found to be inappropriately used by Fire Officials more often than Building Officials; he just wants whatever is approved in the SFPC to be approved here.
- Mr. Payne suggests the following language: 10.1.1 Consultation and notification. Prior to approval of emergency supplemental hardware, the building code official shall consult with the local fire code official or state fire code official if no local fire code official exists, and head of the local law enforcement agency. The local fire code official, the state fire code official, and the local fire, EMS and law enforcement first responders shall be notified of such approval, after approval of such emergency supplemental hardware by the building code official.
- Mr. Willham brings up the “locks and latches” clause as supporting textual evidence: section 1010.1.9.3.
- Mr. Milliken, Ms. Hale, and Mr. Witt discuss who has the ability to revoke a previously-approved code. Mr. Witt claims that there is no authority for a fire official to revoke anything.
- Mr. Milliken suggests we duplicate the previously-approved language.
- Mr. Payne says that Ch. 1 grants administrative authority, and a state amendment. overrides that such as in this case. Mr. Witt disagrees, saying it is the opposite – that fire officials’ authority consists of maintenance-only and that is codified in law.
- Ms. Hale maintains that fire officials perform both operations and maintenance.
- Mr. Witt is in opposition if the last proposed sentence is included.

Result: Non-Consensus

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# FP103.2.1 (VFSB SFPC Edit Part 5)-18

Proponents: Andrew Milliken (amilliken@staffordcountyva.gov)

## 2015 Virginia Statewide Prevention Fire Code

Add new text as follows:

**909.16.3 Control action and priorities.** Unless otherwise approved by the applicable building code, the fire fighter's control panel actions shall operate as follows:

1. ON-OFF and OPEN-CLOSE control actions shall have the highest priority of any control point within the building. Once issued from the fire fighter's control panel, automatic or manual control from any other control point within the building shall not contradict the control action. Where automatic means are provided to interrupt normal, nonemergency equipment operation or produce a specific result to safeguard the building or equipment including, but not limited to, duct freezestats, duct smoke detectors, high-temperature cutouts, temperature-actuated linkage and similar devices, such means shall be capable of being overridden by the fire fighter's control panel. The last control action as indicated by each fire fighter's control panel switch position shall prevail. Control actions shall not require the smoke control system to assume more than one configuration at any one time.

Exception: Power disconnects required by NFPA 70.

2. Only the AUTO position of each three-position firefighter's control panel switch shall allow automatic or manual control action from other control points within the building. The AUTO position shall be the NORMAL, nonemergency, building control position. Where a fire fighter's control panel is in the AUTO position, the actual status of the device (on, off, open, closed) shall continue to be indicated by the status indicator described in Section 909.16.1. Where directed by an automatic signal to assume an emergency condition, the NORMAL position shall become the emergency condition for that device or group of devices within the zone. Control actions shall not require the smoke control system to assume more than one configuration at any one time.

-

**916.8 System activation.** Unless otherwise required by the applicable building code, 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 flammability limit (LFL).
2. For nonflammable gases, a gas concentration exceeding one-half of the IDLH, unless a different threshold is specified by the 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 the code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall remain distinct from fire alarm and carbon monoxide alarm signals.

-

**Reason Statement:** This proposal includes items that were submitted by the VFSB but were not reviewed and decided on by the SFPC Edit Workgroup or Workgroup 2.

**Cost Impact:** The code change proposal will not increase or decrease the cost of construction  
This proposal is not related to construction.

**Resiliency Impact Statement:** This proposal will increase Resiliency  
This group of proposals will increase resiliency.

# Workgroup Recommendation

**Workgroup 2 - Final Committee Action:** Non-Consensus

**Workgroup 2 - Final Reason:** The two code sections (SFPC Sections 909.16.3 and 916.8) included in this proposal were overlooked at the September 1, 2020 Combined Workgroup meeting and were not discussed or decided on by Workgroup 2.

**Note (by DHCD Staff 10/7/2020):**

After the September 1st combined workgroup meeting, the proponent (Andrew Milliken, VFSB C&S Committee Chair) continued discussions with several SFPC Edit Workgroup participants (Sean Farrell, Jimmy Moss, Rick Witt, Ernie Little, Shaun Pharr and Kenney Payne). The group reached consensus on the following modified version of SFPC Section 909.16.3:

" 909.16.3 Control action and priorities. All fire fighter's control panel actions and priorities required by the applicable building code shall be maintained as approved."

The above amended proposal for Section 909.16.3 was also shared with Workgroup 2 (via email) and received no objections.

Consensus was not able to be reached on Section 916.8. The non-consensus proposal for Section 916.8 remains as follows:

916.8 System activation. Unless otherwise required by the applicable building code, 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 flammability limit (LFL).
2. For nonflammable gases, a gas concentration exceeding one-half of the IDLH, unless a different threshold is specified by the 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 the code requiring a gas detection system. Audible and visible alarm signals associated with a gas detection alarm shall remain distinct from fire alarm and carbon monoxide alarm signals.

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## Board Decision

**PCH Action:** None

**Board Reason:** N/A

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## Board Decisions

- Approved
  - Approved with Modifications
  - Carryover
  - Disapproved
  - None
-

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**The following are excerpts for SFPC  
proposals discussed at the Workgroup 1  
meeting on June 23, 2020**

Virginia Statewide Fire Prevention Code

**FP107.2(1)** Operational permit for State Regulated Care Facilities (SCFRs).

**Proponent:** Andrew Milliken, Stafford County Fire Dept.

**Comments:** All were in support.

**Results: Consensus for Approval**

**FP107.2(2)** Operational permit for commercial cooking.

**Proponent:** Andrew Milliken, Stafford County Fire Dept.

**Comments:**

- Mr. Pharr (AOBA/VAMA) states that AOBA/VAMA support FP107.2(2)
- Mr. Beahm (Warren County) dissents on the basis that this measure is “too intrusive.”
- Mr. Catlett (Catlett Consulting) mentions that if you have a commercial cooking appliance in your home, you might not be producing enough damaging byproducts (grease and vapors) to cause a safety concern.
- Ms. Hale (Loudoun County Fire) brings up how the commercial businesses still should be subject to scrutiny, even during COVID closures.
- Mr. Witt (VBCOA) asks about whether this covers daycare facilities and church fellowship halls. Mr. Milliken clarifies that those types of facilities, if already covered by preexisting codes, would be exempt from this additional code regulation.
- Mr. Beahm brings up “change of use” and how those who are reviewing the code might find the proposed language and interpretation problematic.
- Mr. Milliken clarifies the exemptions held above.
- Mr. Beahm raises the concern for home businesses, home bakeries in particular.
- Ms. Davis of DHCD asked if creating a VA Department of Health exemption similar to the existing USBC restaurant requirements for farm structures would work. Mr. Beahm is concerned regarding whether the caveat would create the restriction of having to operate as a restaurant.
- Mr. Catlett brings up the Department of Agriculture and catering services and whether using the commercial appliances offsite affects the meaning of the proposal.

- Mr. Farrell (VBCOA) wishes to clarify the meaning of “assembly use group” and brings up three separate classifications elsewhere for this language (restaurant vs. not a restaurant, occupancy limits, etc.)
- Mr. Milliken clarifies that his proposal is not intended to define what an assembly use group is, but it should only cover the equipment that would require a permit. He also clarifies that the localities can also provide more stringent definitions than the proposal outlines, but this is the baseline.
- Ms. Hale suggests adding “open to the public” to limit the application of this proposal.
- Mr. Witt raises a question regarding whether something is inspected and approved, what the continuing issue would be with obtaining a permit. Would it be after inspection?
- Mr. Catlett rephrases Mr. Witt’s question regarding obtaining an operational permit.
- Ms. Davis of DHCD maintains that this process is already in place - that for COO compliance, an occupational permit is already required.

**Results: Carryover to August meeting**

### **FP112.5 Application for appeal.**

**Proponent:** Linda Hale, Loudoun County Fire Department

**Comments:**

- Mr. Pharr (AOBA/VAMA) supports the intent of the code change, but doesn’t think there is a statutory basis for expanding or altering this change. He mentions that there is no language regarding “standing” until much later in the summation. He supports revising this statement with recognition of the VCC.
- Mr. Witt (VBCOA) is concerned about the overreach that may result in this code change, and whether those who enforce code have the right to do what the passage describes.
- Mr. Payne (AIA Virginia) also raises concerns about distance from a homeowner via number of feet to a fireworks stand. He worries about the word “aggrieved” and that AIA Virginia cannot support as written.
- Mr. Milliken (FSB) summarizes that the Fire Services Board is willing to sign off on it with the language amended.
- Ms. Hale takes these semantic concerns into account and suggests the AG take a look at it, with respect to what the TRB would advise.
- Mr. Pharr discusses the interpretation of “aggrieved” in the context of different examples. Semantically he does not support due to the legal language being unspecific, but he supports the spirit of the code change.
- Mr. Allen (Henrico County) would like to clarify the difference between standing and status.
- Ms. Hale is in support of carrying over to August.

**Results:** Carry over to August meeting; support of the intent, just need to finesse language.

**The following are excerpts for SFPC  
proposals discussed at the  
Workgroup 2 meeting on July 1, 2020**

**Meeting-Specific Notes:**

- Reordered review of Energy proposals
- Request Submitted by Proponent to withdraw **FP604.8** by Jay Hall

**Ms. Davis welcomed everyone to the Workgroup meeting and thanked them for participating in the process. Future workgroup dates were provided.**

**FP101-18 - Tall Wood Appendix (IFC)**

**Proponents:** John Catlett ([catlettcodeconsulting@gmail.com](mailto:catlettcodeconsulting@gmail.com))

**Comments:** Mr. Catlett agrees that both this proposal and its companion proposal (BU101-18, introduced to Workgroup 2 at the 6/30 meeting) could use some clarification.

**Results:** Carryover to August meeting

Ms. Davis thanked all of the stakeholders that worked on the next two proposals of fire code edits. She acknowledged the hundreds of hours of work that went into finalizing these edits.

**FP103.2.1 (VFSB SFPC Edit Part 2)-18 (Edits Chapters 27 & 50-56)**

**Proponents:** Andrew Milliken ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Public Comments for:** FP103.2.1 (VFSB SFPC Edit Part 2)-

**Comments:** Proposal from the Fire Code Edit Workgroup

**Results:** Consensus for Approval

**FP103.2.1 (VFSB SFPC Edit Part 3)-18 Edits Chapters 57-67**

**Proponents:** Andrew Milliken ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)); Thomas King ([thomas.king@dhcd.virginia.gov](mailto:thomas.king@dhcd.virginia.gov))

**Comments:** Proposal from the Fire Code Edit Workgroup

**Results:** Consensus for Approval

### **FP202(4)-18: Adds a “cooking tent” definition**

**Proponents:** Linda Hale of Loudoun County Fire Marshal’s Office ([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov))

**Comments:** Ms. Davis wishes to clarify whether this would apply even to a 10x10” pop-up tent, or just anything that is producing grease-laden vapors. Ms. Hale indicated that this could be for a pop up.

**Results:** Consensus for Approval

### **FP319.1.1-18: Adds wheel chocks and minimum distance provisions for food preparation vehicles**

**Proponents:** Linda Hale of Loudoun County Fire Marshal’s Office ([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov))

**Comments:**

- Mr. Beahm representing himself questions whether the non-registered-vehicles that are not road-worthy are considered mobile food preparation vehicles.
- Ms. Hale (Loudoun County) clarifies that the vehicles themselves might not even need to be mobile or in working order; if they have wheels, they are applicable. They can still cause problems regardless of their road-worthiness.
- Mr. Dawson of NFPA is in support of the proposal on the grounds of food trucks that are up on cinderblocks would still apply; they don’t fall under building codes because they aren’t structures.
- Mr. Beahm representing himself agrees on principle, but wishes for more clarified language to limit the interpretation. However, he does not oppose.

**Results:** Consensus for Approval

### **FP319.2.1-18: Designated AHJ for food truck permit**

**Proponents:** Linda Hale of Loudoun County Fire Marshal’s Office

([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov))

**Comments:**

- Mr. Dyer of SFMO supports the proposal FP319.2.1-18
- Mr. Beahm representing himself supports this change.
- Ms. Eggerton (Alexandria) mentions that this would support economic recovery for small businesses
- Mr. Milliken (Fire Services Board Codes and Standards Committee) supports this change
- Ms. Davis (DHCD) clarifies that Ms. Hale (LCFMO) will add language to clarify that it is referring to a Virginia local government and language for food trucks coming in from out-of-state, to address concerns raised by the group and bring the proposal back in August.

**Results:** Carryover to August, plan to approve then with more specific language added

### **FP405.2-18: Fire and evacuation drill frequency (TABLE)**

**Proponents:** Andrew Milliken representing Stafford County Fire Marshal's Office  
([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Comments:** Mr. Milliken brings up the fact that emergency evacuation drills are required in Group R-2 occupancies that are designed or developed and marketed to senior citizens 55 years of age or older.

- Mr. Pharr of AOBA/VAMA worked closely with Mr. Milliken on this proposal and clarified the language within the body of the proposal to include the following clause:  
**Emergency evacuation drills are required in Group R-2 occupancies that are designed or developed and marketed to senior citizens 55 years of age or older in accordance with 42 U.S. Code, Section 3607(b)(2).**
- Mr. Moss with VBCOA will support as long as the above modification is made.

**Results:** Consensus for Approval as Modified

### **FP407.2-18: Material Safety Data Sheets**

**Proponents:** Aaron Engi

**Comments:** Mr. Milliken speaks on behalf of the Fire Services Board Codes and Standards Committee. They are in support.

**Results:** Consensus for Approval.

### **FP604.8-18: Testing of battery powered emergency lights and exit signs**

**Proponents:** William Hall ([william.hall@vadoc.virginia.gov](mailto:william.hall@vadoc.virginia.gov))

**Comments:** Withdrawn by Proponent

**Results:** Withdrawn

### **FP609.2-18: Cooking operations producing grease laden vapors**

**Proponents:** Andrew Milliken representing the Stafford County Fire Marshal's Office  
([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Comments:**

- Ms. Cook of Arlington County wishes to clarify whether this could have any possibility of being a retrofit requirement.
- Ms. Davis of DHCD seeks clarification on whether this proposal would require ventilation to be in place, including mechanical ventilation
- Mr. Payne representing AIA Virginia suggests the language could be more specific regarding whether the grease-laden vapor-producing devices would be held to required ventilation of the spaces
- Ms. Hale suggests this proposal offers direction on use for those who may be confused about what the issue with grease-laden vapors actually is - that the current language

included in the code is sometimes confusing when carrying out guidelines

- Mr. Moss of VBCOA, Mr. Catlett representing himself, Ms. Cook of Arlington County, and Ms. Eggerton of Alexandria all lend suggested language to this proposal to help further clarify
- Ms. Hale of Loudoun County's Fire Marshal's Office speaks in support based on helping define what the initial issue is that would require this amendment in the first place
- Ms. Eggerton of Alexandria points to Mechanical Code as a source of potential problem areas when interpreting this piece of code
- Ms. Cook of Arlington County mentions how the hood ventilation requirements have evolved and is concerned regarding the potential for retro-fit requirements down the line - she does not currently support
- Mr. Moss of VBCOA suggests clarifying language, citing partnership with Mr. Milliken on this concept previously. Mr. Milliken has no objection to making Mr. Moss's proposed change to the language to add further clarity.
- Ms. Eggerton (Alexandria) suggests that a proposed definition change should be run through the mechanical code group because the proposed change could run into issues with the mechanical code.
- Ms. Davis (DHCD) agrees - motion to carry over to August
- Mr. Catlett suggests wordsmithing this to ensure there is no conflict between the codes.
- Mr. Payne of AIA Virginia concurs with Ellen
- Mr. Grace (Fairfax County) concurs as well.
- Mr. Moss and Mr. Milliken resolve to work together to come up with revised language

#### **Additional Public Comments:**

Submitted by William Andrews in cdpVA UTC Suggest add "commercial" to clarify not apply within residences. Expect readers understand intent for inside, not outdoors. 2000 IFC sec. 609.2 read: "A type I hood shall be installed at or above all commercial food heat-processing appliances that produce grease vapors or smoke. Exceptions: Food heat-processing appliances installed within a dwelling unit."

"Commercial Food Heat-Processing Appliance" was defined as in a food-processing establishment, which noted include any building or a portion thereof used for the processing of food. Helps fire official citing portable cooking risk which use not approved by building official. Instead of fire official citing vague unsafe condition or use other than as approved by building official, then need refer to or get building official to verify did not approve that type cooking activity there.

**Results:** Carryover to August meeting

#### **FP807.5.4-18: Group I-3 exception for combustible decorative materials**

**Proponents:** William Hall, Virginia Dept of Corrections ([william.hall@vadoc.virginia.gov](mailto:william.hall@vadoc.virginia.gov))

**Comments:** Mr. Milliken (Fire Services Board Codes and Standards Committee) is in support.

**Results:** Consensus for Approval

### **FP2306.2.1-18: SWCB regulated tanks**

**Proponents:** DHCD Staff. Mr. Brown of DHCD provides context and explanation for this proposal. This proposal was a collaborative effort with DEQ to provide additional pointers in the SFPC where the State Water Control Board regulations should be referenced for certain tanks. Ms. Davis (DHCD) lends further support.

**Comments:** Mr. Milliken of the Fire Services Board Codes and Standards Committee says the FSBCSC has not yet reviewed this proposed change. However, he finds it straightforward and is in support of the proposal.

Ms. Davis of DHCD reassures Mr. Milliken and everyone in the meeting that if a proposal winds up being problematic to one of the stakeholders once it is at the Board review stage, it can still be pulled for further consideration.

**Results:** Consensus for Approval

### **FP2306.2.1.1-18: Inventory records for underground tanks**

**Proponents:** DHCD Staff : Mr. Brown of DHCD and Ms. Meadows of DEQ lend context to this proposal.

**Comments:**

- Mr. Milliken representing Fire Services Board Codes and Standards Committee suggests we “stick close to the Model Code language”
- Ms. Davis of DHCD agrees that the state water control board would supersede ... is there national language we could use to more accurately mirror?
- Ms. Meadows of DEQ confirms that DEQ is fine with adding back in the last sentence.
- Mr. Brown of DHCD says that this is about record-keeping
- Ms. Hale of Loudoun County Fire Marshal’s Office agrees that this can be workable so long as we un-strike the last sentence

**Results:** Consensus for Approval - as Modified (Un-striking the last sentence)

### **FP2403.2.1.3-18: Areas adjacent to spray booths**

**Proponents:** Joseph Willis, Prince William County ([jwillis@pwcgov.org](mailto:jwillis@pwcgov.org)); Haywood Kines, Prince William County ([hkines@pwcgov.org](mailto:hkines@pwcgov.org)); Mr. Willis provides context for the reasoning behind this proposal.

**Public Comments for:** FP2403.2.1.3-18

Discussion by Haywood Kines Jan 31, 2020 20:58 UTC

**Comments:**

- Ms. Davis (DHCD) wishes to clarify whether this would potentially

affect retroactive work; Mr. Willis says no, it wouldn't.

- Mr. Milliken of Fire Services Board Codes and Standards Committee supports this; it cleans up an old Virginia code.

**Results:** Consensus for Approval

### **FP5003.1.1(1)-18: Adds a footnote to MAQ table for new A2L refrigerants**

**Proponents:** Julius Ballanco ([JBENGINEER@aol.com](mailto:JBENGINEER@aol.com)) of Daiken

**Comments:**

- Ms. Hale of Loudoun County Fire Marshal's Office and VPMIA are opposed. She is concerned about the lack of specificity with the language of "mildly flammable," and that the proposal seems to go beyond the scope of what the Fire Marshals' office is able to execute. She believes the proposal is premature.
- Ms. Davis offers the option to Mr. Ballanco to carry over the proposal if he is willing to work with the other groups who are opposed.
- Mr. Ballanco agrees to work with Loudoun County and VPMIA in order to carry the proposal over to Workgroup 4.
- Mr. Milliken adds that the proposal also needs to be in accordance with the Fire Code edits.

**Results:** Carryover to Next Meeting

### **FP5003.1.1(2)-18: Adds a footnote to MAQ table for A2L refrigerants**

**Proponents:** Julius Ballanco ([JBENGINEER@aol.com](mailto:JBENGINEER@aol.com)) of Daiken

**Comments:**

- Ms. Hale of LCFMO voices concerns about jurisdiction, ability for Fire Officials to be able to put this code change into practice. She does not believe this proposal has been vetted properly and is not in support.
- Mr. Grace of Fairfax County, Mr. Beahm representing himself, all move to carry over.

**Results:** Carryover to Next Meeting

### **FP5703.1.2-18: Classified locations for combustible liquids**

**Proponents:** DHCD Staff ([sbco@dhcd.virginia.gov](mailto:sbco@dhcd.virginia.gov))

**Comments:** This is an editorial change only. No one in opposition.

**Results:** Consensus for Approval

### **FP5704.2.13.1.1-18: Exceptions for out of service tanks**

**Proponents:** DHCD Staff ([sbco@dhcd.virginia.gov](mailto:sbco@dhcd.virginia.gov))

**Comments:** Mr. Brown from DHCD explained that this was a result of the meeting with DEQ to align SWCB regs with USBC and SFPC regulations.

- Mr. Millken for Stafford County opposes.
- Ms. Meadows for DEQ mentions how this fire code requirement is currently in direct conflict with SWCB laws and regulations and as such, has created a lot of confusion for fire officials.
- Mr. Brown (DHCD) restates attempt to clean up this language so that compliance is achievable by all parties involved
- Mr. Milliken (Stafford County) suggests that revised language may make it more possible to move toward consensus but that in its current written state, the fire officials would be tasked with enforcing DEQ's regulations.

**Results:** Carryover to August

### **FP5707.1-18: On-demand Mobile Fueling Operations**

**Proponents:** Irene Koulouris; Mr. Catlett of Catlett Consulting speaks to lend background to this proposal.

**Comments:**

- Ms. Davis (DHCD) provided background and overview of the process related to this proposal. Since mobile fueling is prohibited by state law, this will obviously be consensus for disapproval. However, it is being discussed as the proponent did not withdraw the proposal. Additionally DHCD has been tasked with creating a report that details concerns with mobile fueling for members of the General Assembly. This conversation provides an opportunity to identify concerns. It is anticipated that a stakeholder group will be convened this fall for a fuller discussion.
- Mr. Payne of AIA Virginia clarifies with Mr. Catlett and the proponents that all the language should be underlined as it is new language.
- Mr. Beahm representing himself would like to know whether Exception No. 3 would be deleted
- Ms. Davis (DHCD) clarifies that the only removal would be a result of what is already illegal in the state of Virginia
- Mr. Catlett (Catlett Consulting) responds that this proposal would not remove the exemption
- Ms. Hale (Loudoun County) has concerns about trying to address this proposal preemptively - before it is legal in Virginia. She believes it is premature.
- Mr. Beahm representing himself concurs that this proposal is premature.
- Mr. Catlett (Catlett Consulting) invites other workgroup members to address further questions to him between this meeting and fall 2020

**Results:** Consensus for Disapproval

**The following are excerpts for SFPC  
proposals discussed at the combined  
Workgroup 1-4 meeting on August 11, 2020**

**BU101 Tall Wood Appendix**

**Proponent(s):** John Catlett ([catlettcodeconsulting@gmail.com](mailto:catlettcodeconsulting@gmail.com)), Catlett Code Consulting

**Summation of Proposal:** These proposals (FP101) bring in changes approved by the 2021 ICC code update process for construction of Tall Wood (mass timber) buildings.

**Other Pertinent Information:**

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- This proposal and its companion piece, FP101 Tall Wood Appendix, originated in the proposed phase. They were carried over for issues arising from implementation.
- Concerns were voiced regarding the construction requirements as an appendix and the need to ensure that it was not optional. Mr. Witt suggested to get the 2021 language that was approved and insert that into the main body of the code.

**Comments:**

- Ms. Davis (DHCD) provides context for this proposal, Mr. Catlett (AWC) discusses issues with cdpVA and how he has encountered difficulty on his side with updating information to this proposal as he needed to.
- He has attempted to “clean up” the text and appendix, and he also submitted a verification
- Mr. Milliken (Fire Services Board Codes and Standards Committee) is opposed due to this proposal being part of an appendix; he wishes for it to be included in the body of the text.
- Mr. Milliken doesn’t see an issue with this proposal being included as part of the body of the code, but is resistant to it being an appendix in the fire code.
- Ms. Davis agrees - she suggests wordsmithing it.
- Mr. Catlett has no issue including this language in Chapter 3 as opposed to an appendix, claims this is based on 2018 code language - he suggests carrying this over to the September meeting to give time to wordsmith it to satisfy both the Fire Services Board concerns and the American Wood Council
- Mr. Coats of the American Wood Council is happy to work with Mr. Catlett on this as well as Mr. Milliken.

**Results:** Carry over to 9/1

**FP101 Tall Wood Appendix**

**Proponent(s):** John Catlett - Catlett Code Consulting (representing American Wood Council)

**Summation of Proposal:** This is a companion proposal to BU101 and reflects changes approved for mass timber construction by the 2021 ICC code process.

**Other Pertinent Information:** Along with BU101, this proposed change was carried over from the 2019 Workgroup 1&2 meeting.

**Comments:** See Companion Proposal BU101.

- Ms. Eggerton clarifies that this would not apply to historic buildings and would be a cost-saving measure to all others.
- Ms. Baker clarifies that this proposal only covers Proposal Section B, and to ignore Section A.
- Mr. Witt wants to clarify about whether this enforces a standard that is not applied to other building structures of having to bring all buildings up to all most modern standards when they change occupancy.
- Mr. Beahm mentions that if the proposal were only limited to Option B, he may have a different answer or opinion, but at the moment he is still opposed.
- Mr. Penniman (Sierra Club) reiterates the importance of energy efficiency, he is still in support.
- Mr. Lacey mentions that the 2015 Virginia Residential Code already includes the residential language in section N1111.2, almost verbatim. This proposal just puts it into the Existing Building Code.
- Ms. Harnish and Ms. Baker suggest carrying all three proposals over to the September meeting to let Kenney Payne and Allison Cook air their insights, too.
- Ms. Davis agrees.

### **FP103.2.1 Supplemental info**

**Proponent(s):** Andrew Milliken (SFPC) - [amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)

**Summation of Proposal:** Helpful for users to identify which applicable building code applies.

**Comments:**

- Ms. Davis notes that this supplemental information is not a proposal, per se, but it is not something that goes through a regulatory process.
- Mr. Milliken wishes for this to be consistently incorporated into building code discussions.
- Ms. Davis agrees to discuss this further.

**Results:** This is not a proposal

### **FP103.2.1 VFSB SFPC Edit Part 4**

**Proponent(s):** Andrew Milliken (SFPC) [amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)

**Summation of Proposal:** This proposal includes VFSB recommended changes to Chapters 1-9 and 38 of the SFPC that have been reviewed and recommended by the SFPC Edit Workgroup

**Comments:**

- Ms. Davis mentions that this proposal is intended to remove construction language and clarify maintenance language regarding how the fire service does inspections.
- Mr. Milliken is very appreciative of the fact that there was an additional Fire Code Edit to help workshop this further.
- Mr. Witt wishes to carry this to the 9/1 meeting, so that the committee has a chance to review the parts of the chapters 1-9 within FP103.2.1 that they haven't addressed yet.
- Ms. Davis and Mr. Brown (DHCD) clarifies that the ones we have consensus on, out of the SFPC edits, will move forward – but not the ones that have not been reviewed yet -- in response to Mr. Witt's concerns.
- Mr. Moss speaks in support.

**Results:** Consensus for Approval

**FP103.2.1 VFSB SFPC Edit Chapters 1-10**

**Proponent(s):** Andrew Milliken (SFPC) - [amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)

**Summation of Proposal:** This proposal includes VFSB recommended changes to Chapters 1-10 and 38 of the SF

**Comments:**

- Those concerned with these edits haven't gotten to Ch. 9 yet, so making a decision for Chapters 1-10 would be premature at this time.

**Results:** Carry over to 9/1 Meeting

**FP107.2(2) Commercial cooking operational permit**

**Proponent(s):** Andrew Milliken (Stafford County Fire), [amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)

**Summation of Proposal:** This adds an operation permit for commercial cooking operations outside the situations where it already applies.

**Comments:**

- Mr. Beahm previously had concerns, but is fine with the proposal as it stands currently.

**Results:** Consensus for Approval

**FP112.5 Application for appeal**

**Proponent(s):** Linda Hale, Loudoun County Fire ([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov)); Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** This proposal seeks to clarify who can file appeals for decisions made by the Fire Official.

**Comments:**

- Ms. Hale provides context for this proposal.
- Mr. Pharr supports the intent, but he is concerned about the statutory authority and thinks it needs further clarification.
- Ms. Davis gives voice to a conversation she had recently with the assistant AG who says there is no statutory issue, but that he is concerned that this may be more of a zoning issue, and may be hard to enforce.
- Mr. Witt has issues with the language. He believes it is too broad and is seeking more specific definitions for pieces like “economic impact” and “adverse effects.”
- Mr. Dyer (SFMO) is in support.

**Results:** Non-Consensus

### **FP319.2.1 Permits for food trucks**

**Proponent(s):** Linda Hale, Loudoun County Fire ([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov)); Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** Adds permit requirements for food trucks.

**Comments:**

- Ms. Hale provides context for this proposal.
- Mr. Smith (Farm Bureau of Virginia) has no comment on it, but that he sent it to the Food Truck Association and heard nothing back from them.
- Mr. Witt is concerned that this sets up a conflict between the local government and the state fire office.
- Ms. Hale clarifies that this is not a divergence from what is already in the code.
- Ms. Hale and Ms. Davis engage in conversation regarding which jurisdictions would be the ones to have permits issued per food truck.

**Results:** Consensus for Approval

### **FP609.2 Ventilation for cooking operations**

**Proponent(s):** Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** This proposal indicates how a fire official can interface with the building official for cooking operations occurring without adequate ventilation.

**Comments:**

- Mr. Witt has issues with this proposal. He wants to parse out parts of the proposal, and he wonders about the necessity of specifying grease-laden vapors, as opposed to anytime a cooking operation is being performed.
- Ms. Hale is in support; she disagrees with Mr. Witt and claims that the specificity is very necessary.
- Mr. Moss (Fire Code Subcommittee) is in support.
- Mr. Grace (VPMIA/VBCOA) also wishes to discuss with Mr. Milliken and Mr. Witt.

**Results:** Carry over to 9/1

### **FP3104.15.5 Cooking tents**

**Proponent(s):** Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** Correction by the VFSB Codes and Standards Committee to avoid conflicting terms due to the new definition of "cooking tent"

**Comments:** None

**Results:** Withdrawn

### **FP3107.12.5 Cooking tents**

**Proponent(s):** Linda Hale, Loudoun County Fire ([Linda.Hale@Loudoun.gov](mailto:Linda.Hale@Loudoun.gov))

**Summation of Proposal:** This proposal adds additional safety precautions and clarifies that cooking tents, regardless of whether they have sides, are included in this provision.

**Comments:**

- Ms. Hale (Loudoun County Fire) provides context for this proposal.
- Mr. Smith (Farm Bureau of Virginia) is opposed.

- Mr. Milliken (Fire Code Standards Committee) acknowledges that whether there are drops on the side of the tent does not actually matter, and that Mr. Smith's fears that this would affect a farmers' market are thus moot.
- Ms. Hale maintains that this is designed to make the existing code clearer, it doesn't actually change anything.
- Mr. Smith suggests carrying over and talking with Linda Hale.

**Results:** Carry over to 9/1

### **FP5003.1.1(1) Footnote for max refrigerant**

**Proponent(s):** Julius Ballanco ([JBENGINEER@aol.com](mailto:JBENGINEER@aol.com))

**Summation of Proposal:** This adds a footnote for Group A2L refrigerants to the MAQ table in Chapter 50.

**Comments:**

- Mr. Glass (Goodman Manufacturing) represents Mr. Ballanco, who is unable to make this meeting.
- Mr. Milliken clarifies that the Fire Code Edits removed these tables. He also mentions that it is important to measure against the SFPC to make sure the footnote makes sense.
- Mr. Shapiro (International Code Consultants) claims it's being discussed for 2024. Nothing for 2021 related to refrigerant storage.
- Ms. Hale mentions that she doesn't think it is necessary - there is no data to support this since it hasn't been discussed yet by the ICC.
- Mr. Milliken mentions that because it's in the wrong book entirely, it should be voted as consensus for disapproval.

**Results:** Consensus for Disapproval

### **FP5003.1.1(2) Footnote for max refrigerant**

**Proponent(s):** Julius Ballanco ([JBENGINEER@aol.com](mailto:JBENGINEER@aol.com))

**Summation of Proposal:** This adds a footnote for Group A2L refrigerants to the MAQ table in Chapter 50.

- Comments:**
- Mr. Glass wishes to clarify whether the table is removed for the Virginia fire code; Ms. Davis clarifies that this is only in regard to the IFC, but the reference still remains.

**Results:** Consensus for Disapproval

### **FP5704.2.13.1.1 Exceptions for SWCB tanks**

**Proponent(s):** Resiliency Subworkgroup

**Summation of Proposal:** Makes reference to the SWCB regulation section since there are some specific requirements that are different from the requirements in this section.

**Comments:** Mr. Brown of DHCD gives context.

**Results:** Consensus for Approval.

**The following are excerpts for SFPC proposals  
discussed at the Combined Workgroup 1-4  
meeting on September 1, 2020**

**B101 Tall Wood Supplemental Info**

**Proponent(s):** John Catlett, ([catlettcodeconsulting@gmail.com](mailto:catlettcodeconsulting@gmail.com)), Catlett Code Consulting, The American Wood Council

**Summation of Proposal:** This proposal brings forward changes approved for the 2021 IBC and IFC for construction of Tall Wood (mass timber) buildings.

**Background Information:**

- This proposal and its companion FP101 were carried over from the proposed phase, as well as the August 11, 2020 Combined Workgroup Meeting to iron out details related to implementation.
- In Workgroup 1&2, concerns were voiced regarding the construction requirements as an appendix and the need to ensure that it was not optional. Mr. Witt had suggested to get the 2021 language that was approved and insert that into the main body of the code.

**Comments:**

- Mr. Brown (DHCD) explained that he assisted the proponent in updating the proposal by incorporating the 2021 tall wood provisions by reference in Chapter 6 instead of adding the provisions in an appendix as previously proposed. The new format provides an alternative compliance path at the option of the permit applicant. It allows a building to be constructed in accordance with the 2021 IBC and IFC provisions specific to mass timber and types IV-A, IV-B or IV-C construction while also complying with all other provisions of the 2018 IBC/VCC. The amendments to the IFC in this proposal are made to the IFC as it is referenced by the VCC, not the SFPC.
- Mr. Brown also indicated that the proposal would be changed from “BU101” to “B101” going forward because it is no longer slated to be an appendix.

- The referenced/incorporated 2021 IBC tall wood provisions will be included as supplemental info in the back of the printed 2021 VCC books so it won't be necessary to purchase the 2021 IBC in order to use the new compliance path.
- Mr. Payne wishes to know if the 2021 IBC reference is intended to include Virginia amendments to the referenced sections. Ms. Davis responds that since the 2021 sections are only specific to Tall Wood, they did not exist in the 2018 Codes. Therefore amendments are not an issue. Mr. Payne wants to make sure it is straightforward and that this change wouldn't require multiple books when building.
- Mr. Beahm suggests this should indicate that the proposal should state specifically which 2021 provisions and which 2018 provisions are applicable. Mr. Brown (DHCD) clarifies that the current proposal includes all 2021 provisions specific to mass timber or Types IV-A, IV-B or IV-C construction, but otherwise all 2018 VCC provisions would be applicable.
- Mr. Beahm and Mr. Payne are concerned that for "laymen" it may be confusing to say all other requirements of "this code". It would be better to say the 2018 VCC.
- There was agreement to change the last sentence to read "...as well as all other applicable provisions of the 2018 VCC, including provisions for buildings of type IV construction."

**Result:** Consensus for Approval as Modified

## **FP101 Tall Wood Supplemental Information**

**Proponent(s):** John Catlett, ([catlettcodeconsulting@gmail.com](mailto:catlettcodeconsulting@gmail.com)), Catlett Code Consulting, The American Wood Council

**Summation of Proposal:** This is a companion proposal to B101 that brings forward changes approved for the 2021 IFC related to maintenance and operation aspects of mass timber construction, to the SFPC.

### **Background Information:**

- Along with B101, this proposed change was carried over from the proposed phase, as well as the August 11, 2020 Combined Workgroup Meeting. See background information for proposal B101.

### **Comments:**

- Mr. Farrell claims the SFPC is not applicable to buildings under construction so he isn't sure how the proposed Section 3308.9 could even be enforced by the fire official.
- Mr. Pharr agrees with Mr. Farrell and indicates that state law says that the SFPC is not enforced until after CO.
- Mr. Catlett disagrees.
- Mr. Farrell says the VCC and IFC Chapter 33 covers these requirements already, but the requirements are enforced by the building official. Adding requirements in Chapter 33 of the SFPC may be problematic
- Mr. Catlett made a point that Chapter 33 in the SFPC has not been amended out of the code so he doesn't see how this is any different since this is just adding to it.
- Mr. Milliken says having Section 3308.9 in the SFPC is an important provision for the cooperation of the Fire Official and the Building Official; he is in support. He cites a large number of wooden frame fire accidents recently.

- Mr. Dawson says he does think the Fire Code applies to buildings under construction and thinks those who are opposed might be taking a broad view of the law.
- Ms. Hale echoes Mr. Catlett.
- Kenney Payne - AIA Virginia asks if amending the VCC 3302.3 would be the path to get to SFPC Chapter 33.
- Ms. Davis asks which authority would enforce if requirements were in both the VCC and SFPC.
- Mr. Beahm asks if it would mean we would need both Fire and Building approvals before construction.
- Mr. Farrell says that adding the language of this proposal into the SFPC may be problematic for enforceability.
- Mr. Milliken says that he will remove his support of proposal B101 if this one moves forward as NC, and allow both tall wood proposals to move forward as NC. Ms. Hale agrees.
- Mr. Farrell just wants to make sure this could be enforceable. He has no issues with the code in itself.
- Mr. Catlett has no issues with this proposal being flagged for attorney general office input prior to the Board Meeting.
- Mr. Witt suggests it should be Non-Consensus.
- Mr. Dyer supports the idea of Consensus.
- Mr. Farrell agrees on Consensus for Approval pending legal review of Section 3308.9 items 3 and 4.
- Everyone agreed to move the proposal forward as CA, pending review by AG to verify if Section 3308.9 would be enforceable under the SFPC prior to a CO being issued.
- Mr. Beahm suggested changing “fire code official and the fire chief” to “AHJ”. Mr. Catlett agreed.

**Result:** Consensus for Approval as Modified -Changing item 2 to “authority having jurisdiction”. Result pending legal review with the A.G. of items 3 and 4 of Section 3308.9-  
*Review whether the SFPC only applies after CO.*

## **FP609.2 Ventilation for cooking operations**

**Proponent(s):** Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** This proposal indicates how a fire official can interface with the building official for cooking operations occurring without adequate ventilation.

**Background Information:** This one has changes from the previous meeting; changed the name to “cooking operations” and worked with Rick Witt on consensus language.

**Comments:**

- Mr. Witt said that we been discussing for some time now and is ready to move it forward.
- Mr. Payne noted some issues with the wording.
- Ms. Hale clarified that the intent is the ventilation has to be turned on and has to be in operation.
- Mr. Grace (VPMIA) suggests some language to clarify “such ventilation as required”.
- Mr. Witt has no issues with the proposal if all that’s left to do is wordsmith.
- Mr. Milliken and Ms. Hale both agree that further clarifying the word “ventilation” instead of just saying “it”.
- Mr. Farrell suggests removing “where” and “is” and the “it” before “shall” – ***“Ventilation at or above the applicable building code... shall be operated and maintained”***.

**Result:** Consensus for Approval as Modified

## **FP3107.12.5 Cooking tents**

**Proponent(s):** Andrew Milliken, Stafford County Fire ([amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov))

**Summation of Proposal:** This proposal adds additional safety precautions and clarifies that cooking tents, regardless of whether they have sides, are included in this provision.

**Background Information:**

- One of several proposals that initially posited additional regulations for cooking tents during this code cycle.
- The Farm Bureau initially had concerns.

**Comments:** Mr. Smith of the Farm Bureau has removed his opposition after meeting with Ms. Hale to review the proposed changes prior to today’s meeting.

**Result:** Consensus for Approval

## **FP103.2.1 SFPC Edits Part 4**

**Summation:** This proposal includes sections that were reviewed by the SFPC edit workgroup during the July 30th SFPC Edit Workgroup meeting and recommended as CA by Workgroup 1 on August 11th. Additional items reviewed by the SFPC Edit WG at the August 20<sup>th</sup> meeting have been added to this proposal for consideration by Workgroup 1 today.

**Comments:** None

**Result:** Consensus for Approval

## **FP103.2.1 SFPC Edit Chapters 1-10**

**Proponent(s):** Andrew Milliken (SFPC) - [amilliken@staffordcountyva.gov](mailto:amilliken@staffordcountyva.gov)

**Summation of Proposal:** This proposal includes all remaining SFPC sections submitted by the VFSB that were not able to be reviewed by the SFPC Edit workgroup.

**Background Information:**

- Although the edits to SFPC Chapters 1-10 were completed during the 2015 code update cycle, the VFSB submitted additional changes to Chapters 1-10 of the SFPC in June 2020. Additional SFPC Edit Workgroup meetings were scheduled in an attempt to review these additional changes prior to the August 11<sup>th</sup> Combined Workgroup meeting. At the time of the August 11<sup>th</sup> Combined Workgroup meeting, all items that had been reviewed by the SFPC Edit WG were approved by Workgroup 1 (See proposal “FP103.2.1 SFPC Edits Part 4” above). The group agreed to carry over any remaining items to the 9/1 meeting and one more additional SFPC Edit Workgroup meeting was held on August 20, 2020. All items reviewed by the SFPC Edit WG at the August 20<sup>th</sup> meeting were added to proposal “FP103.2.1 SFPC Edits Part 4” and recommended CA by Workgroup 1 today.

**Comments:**

- The group utilized the remainder of the meeting to review all remaining SFPC Edit items (approximately 53 individual code sections) and make recommendations on each.
- Mr. Brown clarified that all items that receive recommendations today will be added to consensus proposal FP103.2.1 SFPC Edits Part 4. If there are any individual sections that are missed or do not receive a recommendation today they will remain with this proposal “FP103.2.1 SFPC Edit Chapters 1-10”.
- Due to a document mix up, a couple of sections that had previously been reviewed and had recommendation may have been re-reviewed today. Mr. Brown clarified that if staff finds that is the case, the final review and recommendation from today will go forward. Note: During post meeting reviews, staff only found two instances of re-reviewed sections, and neither included non-consensus items.

**Result:** Non-Consensus (This recommendation is only applicable to any items remaining as part of this proposal as they did not receive a Workgroup 1 review and recommendation today.)

## **1030.1 General**

**Result:** Consensus for Approval

## **1030.2 Minimum size**

- Restores technical language, connects it back to the applicable building code. Makes sure operation of window is maintained, as well as the height to the floor.
- Mr. Witt, Mr. Farrell have concerns about enforceability.
- Mr. Sharp mentions how in previous codes, it may have been based on sill height.
- Ms. Hale says that operations matter; being able to open and operate the window properly.
- Mr. Willham agrees that it used to be based on sill height.
- Mr. Shapiro is in support of the text as it is.
- Mr. Witt opposes the idea of the “normal operations” language, claims it is too subjective to be enforced correctly.

**Result:** Consensus for Approval as Modified

### **1030.3 Maximum Height from Floor**

- Mr. Farrell wants to make sure we are not forcing retroactive revisions to the code for current building owners.
- Mr. Moss suggests the following language: Emergency escape and rescue opening height shall be maintained in accordance with the applicable building code.
- Mr. Beahm states that he agrees with Mr. Moss' language.
- Mr. Payne suggests that Mr. Moss' recommendation would need to specify height.
- Mr. Willham mentions that up until 2012, things were still measured to the sill.
- Mr. Brown (DHCD) enters some modified language.

**Result:** Consensus for Approval As Modified

### **1030.4 Window Wells**

**Result:** Consensus for Approval

### **1030.5 Bars, grilles, covers and screens**

- Mr. Payne asks if the language could say “maintained and operated” in accordance with the applicable building code. He is not opposed to what is there already.
- Mr. Milliken agrees.
- Ms. Hale adds that sometimes, there is no applicable building code that applies, but that this regulation would help cut down on the confusion.

**Result:** Consensus for Approval

### **1031.4 Exit Signs (Revises a Reference to Ch. 12)**

- Mr. Witt wants to have the word “installed” fixed to “maintained.”
- Mr. Milliken acknowledges this oversight and agrees to that change.

**Result:** Consensus for Approval As Modified

### **1031.9 Floor Identification Signs**

**Result:** Consensus for Approval

### **1031.11 Emergency Supplemental Hardware**

- Mr. Payne wishes to know if the word “maintenance” includes storage, since the second sentence of the proposal indicates how the materials are to be stored. He worries the second sentence may be used to circumvent the first sentence.
- Mr. Witt has concerns about this being maintained in the applicable building code. He disagrees with Mr. Milliken.
- Mr. Payne backs Mr. Witt's assessment. He is opposed if this proposal expands upon what was already agreed upon; AIA Virginia is in support if the proposal is intended to be carried out as was previously discussed.
- Mr. Farrell comments that building officials have the authority to revoke or suspend COO according to the VCC, so he is not sure this is the proper way to explain this.

- Mr. Milliken claims that these items were found to be inappropriately used by Fire Officials more often than Building Officials; he just wants whatever is approved in the SFPC to be approved here.
- Mr. Payne suggests the following language: 10.1.1 Consultation and notification. Prior to approval of emergency supplemental hardware, the building code official shall consult with the local fire code official or state fire code official if no local fire code official exists, and head of the local law enforcement agency. The local fire code official, the state fire code official, and the local fire, EMS and law enforcement first responders shall be notified of such approval, after approval of such emergency supplemental hardware by the building code official.
- Mr. Willham brings up the “locks and latches” clause as supporting textual evidence: section 1010.1.9.3.
- Mr. Milliken, Ms. Hale, and Mr. Witt discuss who has the ability to revoke a previously-approved code. Mr. Witt claims that there is no authority for a fire official to revoke anything.
- Mr. Milliken suggests we duplicate the previously-approved language.
- Mr. Payne says that Ch. 1 grants administrative authority, and a state amendment overrides that such as in this case. Mr. Witt disagrees, saying it is the opposite – that fire officials’ authority consists of maintenance-only and that is codified in law.
- Ms. Hale maintains that fire officials perform both operations and maintenance.
- Mr. Witt is in opposition if the last proposed sentence is included.

**Result:** Non-Consensus

### **1031.12 Area of Refuge**

**Result:** Consensus for Approval

### **1031.13 Door Opening Force**

**Result:** Consensus for Approval

**Add new section 1032.1** – Adding a new section for the Virginia SFPC for Ch. 10;

Attempting to bring in occupancy load language guidelines

- The other way to accomplish this would be by putting some administrative language in Ch. 1; proposal 110.4.1, “Unsafe Occupancy”.
- Mr. Payne wishes to add the word “Section” so it will read “Section 110.4” if that proposal were approved.
- Mr. Witt wishes for the word “note” to be removed; as well as clarifying language added that serves the purpose of letting officials know this is temporary, until a building code official can step in and determine and enforce new (permanent) occupancy load signage.
- Mr. Pharr clarifies with Mr. Milliken that either one or the other of the proposals will be moved forward, whereas the other will be withdrawn.
- Mr. Payne wants to understand if this is for assembly spaces. He wants to know whether there is already existing language to indicate temporary signage.
- Mr. Farrell thinks this has potential but that it still needs to be workshopped.
- Mr. Payne, Mr. Farrell and Mr. Witt all believe this should be carried to the next code cycle; neither 110.4.1 nor 1032.1 is as fully-fleshed out as they would like to see.

- Mr. Payne suggests some other options: referencing the table in the VCC might be a workaround. Mr. Farrell seconds this idea.
- Mr. Willham says that the table is only a reference for maximum safe occupancy loads during initial design, as opposed to being a maximum safe occupancy load from that point forward. He would be hesitant to rely solely or even mainly on the table contained in the VCC for ongoing direction for the code officials regarding occupancy load signage.
- Mr. Milliken mentions overcrowding issues are not always going to be in A-use buildings; that in fact they'll often be in conflict with B-use buildings. Mr. Milliken wants to know whether the language would apply to continuous use (which is more variable) than a fixed number of people providing an occupancy load issue. Mr. Payne discusses with him; Mr. Payne offers to workshop some language and embed it in the chat box during the meeting.
- The participants discuss withdrawing this proposal in favor of trying to reach consensus on 110.4 instead to accomplish the same goals. Mr. Payne workshops specifying language for 110.4.1. (See 110.4.1)

**Result:** Withdrawn

**3804.1.1.6 (revisited)** – modified the language so that it sounds like the emergency or standby power shall be maintained in the context of high school laboratories, as opposed to the code officials maintaining the laboratories themselves.

**Result:** Consensus for Approval as Modified

### **304.1.2 Vegetation**

- Mr. Witt doesn't believe we need some of this language and would prefer that the last sentence be removed from the proposal.
- Mr. Milliken maintains that the Wild Land Urban Interface Code is a referenced standard but does not apply to each state, including Virginia.
- Ms. Hale mentions that it does not have anything to do with building codes; that it refers strictly to vegetation.
- Mr. Farrell mentions that it may be helpful to pull out specific sections from the national code and adopt all of it and add it to the SFPC, as opposed to selectively enforcing based on what is required in Virginia. He suggests we move the pieces that are relevant to Virginia and add them to the SFPC.
- Mr. Witt is concerned that certain vegetation – like pine trees, certain bushes, and so on – will not be allowed to remain next to one's buildings. He thinks this may be an overreach, and encourages Mr. Milliken to push this toward the next code cycle so they can collectively examine the potential ramifications of this proposed change.
- Ms. Davis mentions how the Wild Land Urban Interface Code references only lots that have been designated by the locality as being within a Wild Land Urban Interface area as being required to submit a vegetation plan. She further indicated that this code had been considered for adoption by the BHCD previously and that proposal was disapproved. Mr. Milliken maintains that things have changed and that the Wildfire Risk would be the key element for consideration for this code cycle.

- Mr. Milliken cites 304.1.2 Vegetation: Weeds, grass, vines, or other growth that is capable of being ignited and endangering property shall be cut down and removed by the owner or occupant of the premises. Vegetation clearance requirements in wildfire risk areas shall be in accordance with section 603.1 through 607.2 and Appendix C of the International Wildland-Urban Interface Code.

**Result:** Non-Consensus

### **603.3.1 Fuel Oil Storage**

- Mr. Milliken provided background.
- Ms. Davis Asked when the 660 gallon was established. Do we need verify the quantities have not changed since the early USBC adoption? Mr. Milliken stated they either weren't addressed early on or changed slightly.
- Mr. Brown pointed out that the 2015 and proposed regulations list the 660 gallons so regardless, that will be in there.
- Mr. Milliken clarified that the only change is to remove "comply" so the section would read "be maintained".

**Result:** Consensus for Approval

### **603.3.2.1 Quantity Limits**

- Mr. Witt clarifies that if this proposal does not conflict with existing regulations, then he is on board with this proposed change. Mr. Milliken stated he'll look into this.
- Mr. Little states that the 660 gallon limit is in the 1984 Boca FPC.

**Result:** Consensus for Approval

## **110.4 Unsafe Occupancy**

- There are broad concerns with signage from several stakeholders.
- Mr. Witt explains how there could be more than one occupant load and different occupant loads within sections of a building. He doesn't like the note. He thinks the proposal requires too much work and should be carried over.
- Mr. Milliken feels they need something to address overcrowding since the chapter 10 provisions were deleted.
- Mr. Payne cites 110.7 Overcrowding. Where the fire code official believes that overcrowding may exist, the fire code official shall be permitted to utilize the egress component sizing requirements of Section 1005 of the VCC and occupant load allowances under Section 1004 of the VCC to determine if overcrowding exists. Where such determination is made, the fire code official shall be permitted to require an approved temporary sign posting of the maximum allowable occupant load and such sign shall be maintained until the building official can determine the allowable occupant load at which time a permanent sign shall be posted or the temporary sign may be removed.
- Mr. Farrell explains how the fire official should be determining if a space is overcrowded, how it should be based on the occupant load and how that's determined.
- Mr. Little suggests adding overcrowding "may" exist. Mr. Payne agrees and says he originally used the word "may".

- Mr. Payne and Mr. Farrell have a short back and forth regarding the last sentence. Mr. Payne explained how he understands his concern but that it doesn't affect it the way he thinks it does for determining overcrowding.
- Mr. Farrell thinks this gets us where we need to be. Firm on the building official determining max occupant load. He suggests removing references to sections.
- Mr. Payne, Mr. Witt, and Mr. Farrell work on refining last sentence. Mr. Payne brings up italicizing defined terms.
- Mr. Farrell recommended moving to Chapter 10 and Mr. Milliken agreed. Added the provisions as a subsection - 1001.3.1 Temporary occupant load determination.

**Result:** Consensus for Approval as Modified

## **110.7 Overcrowding**

**Result:** Consensus for Approval as Modified (see 110.4)

### **1001.3.1 Temporary Occupant Load Determination**

- Mr. Dyer and Mr. Witt are both in support of the changes made.
- Ms. Hale wants to make sure this is enforceable.
- Amended language by Mr. Brown of DHCD (as well as weigh-in from Ms. Hale, Mr. Farrell, Mr. Milliken, and Mr. Payne) works for all.

**Result:** Consensus for Approval as Modified

### **1032.2 Emergency Occupant Load Identification**

**Result:** Withdrawn

### **3801.1 Scope**

- Milliken and Mr. Payne explain the changes made at the national level for Higher-ed labs.
- Mr. Beahm grants additional context; these changes were discussed 2-3 years ago.

**Result:** Consensus for Approval

### **3801.2 Application**

**Result:** Consensus for Approval

### **603.3.2.2 Restricted Use and Connection**

**Result:** Consensus for Approval

### **603.3.2.7 Tanks in Basements**

- Mr. Farrell has some concerns with this one and will not revoke his opposition.

**Result:** Non-Consensus

### **605.8.1 Refrigerants Other Than Ammonia**

- Mr. Farrell asks when this was entered into the code. Mr. Milliken says there have been changes and modifications to the code over the years.
- Mr. Witt disagrees with this language and thinks it's a retrofit. He asks if the "approved location" requirement has been the case since this was added to the code. Mr. Milliken answers that it has.
- Ms. Davis recommends applicable building code language. Mr. Farrell supports scoping it that way.
- Mr. Payne questions the language "approved location".
- Mr. Milliken, Mr. Witt, and Mr. Farrell debate the language for a while and delete a lot of it to change it to fit what is already approved in the building code.

**Result:** Consensus for Approval as Modified

### **605.9.1 Refrigeration System Emergency Shutoff**

- Mr. Farrell suggests language. Revised to be in line with previous language.
- Mr. Brown (DHCD) adds, at the proponents' request, language that had been debated earlier and decided upon for previous proposal 605.8.1 and several subsequent proposed edits.

**Result:** Consensus for Approval as Modified

### **605.10.1 Automatic Crossover Valves**

**Result:** Withdrawn

### **605.13 Mechanical Ventilation Exhaust**

- Mr. Brown revises to be in line with previous language

**Result:** Consensus for Approval as Modified

### **605.17.1 Refrigerant Detection Systems Operations**

- Makes the language more inclusive for both modern and older technologies

**Result:** Withdrawn

### **607.2 Where Required. Cooking Operations with Grease-Laden Vapors**

- No discussion

**Result:** Withdrawn

### **701.7 Unsafe Conditions**

- Editorial change, no discussion

**Result:** Consensus for Approval

### **704.2 Opening Protectives**

- Relates to 705. 2

**Result:** Consensus for Approval

### **901.5.1 Occupancy**

- Mr. Witt suggests this one be considered Non-Consensus.
- Mr. Farrell questions why. Mr. Witt argues that because the authority regarding occupancy is a building officials' responsibility, and that it does not fall to a fire official.

**Result:** Non-Consensus

### **905.5.3 Class II System**

- Previous workgroup discussions included terminology, including “fire hose for use by trained personnel”. This proposal attempts to add the language in order to clarify who can utilize the fire hoses in which context.
- Mr. Farrell argues that Class II specifically regards occupants. Mr. Milliken states that the exact proposed language already exists in the current NFPA.

**Result:** Non-Consensus

### **905.9 Valve Supervision**

- Relates to 903.4 for supervision of valves; does not add construction language.
- Mr. King (DHCD) points to the section referenced: 903.4 Sprinkler system supervision and alarms. All valves controlling the water supply for automatic sprinkler systems, pumps, tanks, water levels and temperatures, critical air pressures, water-flow switches and alarms on all sprinkler systems shall remain in service in the normal position and properly sealed, locked, or electrically supervised in accordance with the applicable building code.

**Result:** Consensus for Approval

### **905.11 Locking Standpipe Outlet Caps**

- No need for a Virginia amendment; keep IFC language.

**Result:** Consensus for Approval

### **907.3.2 Special Locking Systems**

- No discussion

**Result:** Consensus for Approval

### **907.3.3 Elevator Emergency Operation**

- No discussion

**Result:** Consensus for Approval, scoping language

### **907.4.2 Manual Fire Alarm Boxes**

- No discussion

**Result:** Consensus for Approval

### **907.4.2.3 Color**

- Mr. Pharr and Mr. Farrell voice concerns (Mr. Farrell has had issues with the “unless the applicable building code” language for several code cycles). Mr. Farrell is concerned this is headed for a “slippery slope” that recent code cycles have leaned on the language of “unless required by the applicable building code”.
- Mr. Pharr brings up the idea of the wall being red – would it apply then?
- Mr. Witt and Mr. Pharr both echo Mr. Farrell’s concerns; believes this could be incorrectly applied as a retrofit requirement
- Mr. Payne posits: if his alarm box is green, and the code language here outlines that the box should be red, would he be out of compliance?

**Result:** Non-Consensus

### **Delete section 907.4.3 and 907.4.3.1**

**Result:** Withdrawn

## **907.5 Occupant Notification Systems**

- Mr. Witt advocates that this be non-consensus.
- Mr. Farrell claims that “technical prescriptive language” plus “the applicable building code” makes this much harder to enforce. It may lead to a conflict of requirements – two codes that are in direct opposition of each other.
- Mr. Milliken suggests the following language: Where required or provided in accordance with the applicable building code, a fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation in accordance with the applicable building code.

**Result:** Consensus for Approval as Modified

### **907.5.2 Audible Alarms**

- Mr. Milliken and Mr. Witt discuss to seek amended language.
- There is some concern regarding the language beyond the first sentence.
- Mr. Brown and Mr. Pharr provides some suggested language; Mr. Farrell agrees.

**Result:** Consensus for Approval as Modified

### **Delete Sections 907.5.2.2.1 and 907.5.2.2.2**

**Result:** Withdrawn

### **907.5.2.2.3 Alternative Uses for Emergency Voices/Alarm Communication Systems**

**Result:** Consensus for Approval (per August 20)

### **905.5.3 Class II System**

**Result:** Non-Consensus

### **907.6.3 Initiating Device Identification**

**Result:** Consensus for Approval

#### **910.4.4 Activation**

- Discussed smoke and heat vents regulations; only manual controls when the fire department says so.
- Amended language, approval

**Result:** Consensus for Approval as Modified

#### **910.4.7 Controls**

- Attempts to make sure manual controls are maintained.
- Mr. Payne, Mr. Milliken and Mr. Brown work on language, eliminating run-on sentences and directives.

**Result:** Consensus for Approval as Modified

#### **912.2 Location**

**Result:** Non-Consensus

##### **912.2.1 Visible Location**

**Result:** Non-Consensus

**FIRE CODE EDIT WORKGROUP  
AUGUST 14, 2019  
DPOR**

**2306.7.7.2**

**FSB Comments:** The location of physical pumps is to remain as originally approved however it is still important to also maintain operational controls which have been consistently in the code for decades. These are not construction requirements.

**Recommendation:** Location. Remote pumps installed above grade, outside of buildings, shall remain in approved locations in accordance with the applicable building code. Dispensing operations shall not be less than 10 feet (3048 mm) from lines of adjoining property that can be built upon and not less than 5 feet (1524 mm) from any building opening. Pumps shall be maintained substantially anchored and protected against physical damage.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Location. Remote pumps installed above grade, outside of buildings, shall remain in approved locations in accordance with the applicable building code. Dispensing operations shall not be less than 10 feet (3048 mm) from lines of adjoining property that can be built upon and not less than 5 feet (1524 mm) from any building opening. Pumps shall be maintained substantially anchored and protected against physical damage. In no case should any of these provisions require demolition or relocation of existing equipment when approved in accordance with the applicable building code.**

**2307.4**

**FSB Comments:** The location of dispensing operations is a key safety issue that is not a construction requirement. Although technical factors remain in the language, all are options for compliance and are not sole prescriptive construction requirements.

**Recommendation:**

Location of dispensing operations and equipment. Unless specifically approved otherwise in accordance with the applicable building code, the point of transfer for LP-gas dispensing operations shall be 25 feet (7620 mm) or more from buildings having combustible exterior wall surfaces, buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly, or buildings having combustible overhands, lot lines of property which could be built on, public streets, or sidewalks and railroads; and at least 10 feet (3048 mm) from driveways and buildings having noncombustible exterior wall surfaces that are part of a fire-resistance-rated assembly having a rating of 1 hour or more.

Exception: The point of transfer for LP-gas dispensing operations need not be separated from canopies that are constructed in accordance with the applicable building code and which provide weather protection for the dispensing equipment. LP-gas containers shall remain located in accordance with Chapter 61 and the applicable building code. LP-gas storage and dispensing equipment shall be operated outdoors and in accordance with Section 2306.7 unless otherwise approved in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Location of dispensing operations and equipment.** Unless specifically approved otherwise in accordance with the applicable building code, the point of transfer for LP-gas dispensing operations shall be 25 feet (7620 mm) or more from buildings having combustible exterior wall surfaces, buildings having noncombustible exterior wall surfaces that are not part of a 1-hour fire-resistance-rated assembly, or buildings having combustible overhands, lot lines of property which could be built on, public streets, or sidewalks and railroads; and at least 10 feet (3048 mm) from driveways and buildings having noncombustible exterior wall surfaces that are part of a fire-resistance-rated assembly having a rating of 1 hour or more. In no case should any of these provisions require demolition or relocation of existing equipment when approved in accordance with the applicable building code.

**Exception:** The point of transfer for LP-gas dispensing operations need not be separated from canopies that are constructed in accordance with the applicable building code and which provide weather protection for the dispensing equipment. LP-gas containers shall remain located in accordance with Chapter 61 and the applicable building code. LP-gas storage and dispensing equipment shall be operated outdoors and in accordance with Section 2306.7 unless otherwise approved in accordance with the applicable building code.

**2308.3.1**

**FSB Comments:** Storage, compression and dispensing are functional operations, not construction. Natural gas is lighter than air. The requirements for the operational location of the activity and associated equipment that compresses and dispenses the gas must take this into consideration. The separation distances from overhead ignition sources should be noted.

**Recommendation:**

Location of operations on property. Unless otherwise approved in accordance with the applicable building code, compression, storage and dispensing equipment not located in vaults complying with Chapter 53 shall be maintained and operated in accordance with Section 2303.1 and as follows:

1. Not beneath power lines.
2. Ten feet (3048 mm) or more from the nearest building or lot line that could be built on, public street, sidewalk or source of ignition.

Exception: Dispensing equipment need not be separated from canopies that are constructed in accordance with the applicable building code and that provide weather protection for the dispensing equipment.

3. Twenty-five feet (7620 mm) or more from the nearest rail of any railroad track and 50 feet (15 240 mm) or more from the nearest rail of any railroad main track or any railroad or transit line where power for train propulsion is provided by an outside electrical source, such as third rail or overhead catenary.
4. Fifty feet (15 240 mm) or more from the vertical plane below the nearest overhead wire of a trolley bus line.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Location of operations on property. Unless otherwise approved in accordance with the applicable building code, compression, storage and dispensing equipment not located in vaults complying with Chapter 53 shall be maintained and operated in accordance with Section 2303.1 and the following. In no case should any of these provisions require demolition or relocation of existing equipment when approved in accordance with the applicable building code:**
  - 1. Not beneath power lines.**
  - 2. Ten feet (3048 mm) or more from the nearest building or lot line that could be built on, public street, sidewalk or source of ignition.**

**Exception: Dispensing equipment need not be separated from canopies that are constructed in accordance with the applicable building code and that provide weather protection for the dispensing equipment.**
  - 3. Twenty-five feet (7620 mm) or more from the nearest rail of any railroad track and 50 feet (15 240 mm) or more from the nearest rail of any railroad main track or any railroad or transit line where power for train propulsion is provided by an outside electrical source, such as third rail or overhead catenary.**
  - 4. Fifty feet (15 240 mm) or more from the vertical plane below the nearest overhead wire of a trolley bus line.**

**2311.7.1**

**FSB Comments:** There are no maintenance requirements in the building code. This proposal also restores reference to an additional operational code section.

**Recommendation:** Ventilation. Repair garages used for the repair of natural gas- or hydrogen-fueled vehicles shall maintain an approved mechanical ventilation system. The mechanical ventilation system shall remain in accordance with the applicable building code and Section 2311.7.1.2.

Mr. Farrell prefers the language in the base document (language on the left) however, Mr. Milliken disagrees because that language doesn't discuss the problems that we have and this does.

**DELETED**

**2311.7.2**

**FSB Comments:** There are no maintenance requirements in the building code.

**Recommendation:** Repair garages shall be used for repair of vehicles fueled by nonodorized gases including, but not limited to, hydrogen and nonodorized LNG, only where provided with a flammable gas detection system in accordance with the applicable building code. Gas detection systems shall be maintained in accordance with Chapter 9 and Section 2311.7.2.1.

**DELETED**

### **2311.7.2.1**

**FSB Comments:** It is critical that a gas detection systems be maintained properly calibrated to activate upon detection of a flammable vapor environment. This section identifies that flammable vapor threshold as 25% of the LFL.

**Recommendation:** System calibration. The flammable gas detection system shall remain calibrated to the types of fuels or gases used by vehicles to be repaired. Unless otherwise approved by the applicable building code, the gas detection system shall activate when the level of flammable gas exceeds 25 percent of the lower flammable limit (LFL).

**DELETED**

### **2311.8**

**Recommendation:** Repair garages for vehicles fueled by lighter-than-air fuels. The room, motor vehicle repair booth or motor vehicle repair space containing repair garage activities for the conversion or repair of vehicles that use CNG, LNG, hydrogen or other lighter-than-air motor fuels shall be in accordance with the applicable building code and Sections 2311.8 through 2311.8.11 in addition to the other requirements of Section 2311. Repair garages for the repair of vehicles that use hydrogen fuel shall be in accordance with this code, the applicable building code and NFPA 2.

Exceptions:

1. Repair garages where work is conducted only on vehicles that have been defueled and their systems purged with nitrogen gas, and where standard operating procedures to document and maintain the fueling status throughout repair operations are approved.
2. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
3. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen fuel system shall contain less than 200 cubic feet (5.6 m<sup>3</sup>) of hydrogen.
4. Repair garages for natural-gas-fueled vehicles where work is not being performed on the fuel storage tank, and is limited to the exchange of parts and maintenance not requiring open flame or welding on the natural-gas-fueled vehicle. During the work, the natural gas, in the vehicle fuel tank shall contain a pressure of not more than 250 psi at 70°F (1724 kPa at 21°C).

**CONSENSUS APPROVED**

### **2311.8.1**

**Recommendation:** Preparation of vehicles for repair. For vehicles powered by gaseous fuels, the fuel shutoff valves shall be closed prior to repairing any portion of the vehicle fuel system. Vehicles powered by gaseous fuels in which the fuel system has been damaged shall be

inspected and evaluated for fuel system integrity prior to being brought into the repair garage. The inspection shall include testing of the entire fuel delivery system for leakage.

### **CONSENSUS APPROVED**

#### **2311.8.2**

**Recommendation:** Repair garages used for the repair of hydrogen-fueled vehicles. Repair garages used for the repair of hydrogen-fueled vehicles shall be maintained and operated with an approved exhaust ventilation system in accordance with the International Mechanical Code and Chapter 6 of NFPA 2.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Repair garages used for the repair of hydrogen-fueled vehicles Repair garages used for the repair of hydrogen-fueled vehicles are required to be provided with an approved exhaust ventilation system in accordance with the applicable building code and maintained in accordance with Chapter 6 of NFPA 2.**

#### **2311.8.3**

**Recommendation:** Motor vehicle repair rooms. Motor vehicle repair rooms shall maintain fire-resistance rated separation from adjacent areas in accordance with Chapter 7 and the applicable building code.

### **CONSENSUS APPROVED**

#### **2311.8.4**

**Recommendation:** Motor vehicle repair booths. The maintenance and operation of motor vehicle repair booths shall be in accordance with Sections 2311.8.4.1 through 2311.8.4.4.

### **CONSENSUS APPROVED**

#### **2311.8.4.1**

**Recommendation:** Construction. Motor vehicle repair booths shall be maintained with approved noncombustible materials in accordance with the applicable building code. Structural sections of motor vehicle repair booths shall remain sealed in an approved manner.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Construction. Motor vehicle repair booths shall be maintained with approved materials in accordance with the applicable building code. Structural sections of motor vehicle repair booths shall remain sealed in an approved manner.**

#### **2311.8.4.2**

**Recommendation:** Surfaces. The interior surfaces of motor vehicle repair booths shall be maintained to permit the free passage of exhaust air from all parts of the interior.

**CONSENSUS APPROVED**

**2311.8.4.3**

**Recommendation:** Means of egress. Means of egress shall be provided in accordance with Chapter 10 and the applicable building code.

Exception: Means of egress doors from premanufactured motor vehicle repair booths shall be not less than 30 inches (762 mm) in width by 80 inches (2032 mm) in height.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Means of egress. Means of egress shall be maintained in accordance with Chapter 10 and the applicable building code.**

**NOTE: Means of egress doors from premanufactured motor vehicle repair booths shall be in accordance with manufacturer's specifications.**

**2311.8.4.4**

**Recommendation:** Clear space. Motor vehicle repair booths shall be maintained so that all parts of the booth provide ready access for cleaning. A clear area of not less than 3 feet (914 mm) wide shall be maintained on all sides of the motor vehicle repair booth. This clear area shall be kept free of any storage or combustible construction.

Exceptions:

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

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Clear space. Unless otherwise approved by the applicable building code, motor vehicle repair booths shall be maintained so that all parts of the booth provide ready access for cleaning. A clear area of not less than 3 feet (914 mm) wide shall be maintained on all sides of the motor vehicle repair booth. This clear area shall be kept free of any storage or combustible construction.**

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

**2. This requirement shall not prohibit locating a motor vehicle repair booth closer than 3 feet (914 mm) to an exterior wall or a roof assembly, provided that the wall or roof is maintained of noncombustible material in accordance with the applicable building code and the motor vehicle repair booth can be adequately maintained and cleaned.**

**2311.8.5**

**Recommendation:** Motor vehicle repair spaces. Where such spaces are not separately enclosed, noncombustible spray curtains shall be maintained and used to restrict the spread of flammable gases.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Motor vehicle repair spaces. Where such spaces are not separately enclosed, noncombustible spray curtains shall be maintained and used to restrict the spread of flammable gases in accordance with the applicable building code.**

**2311.8.6**

**Recommendation:** Fire protection. Motor vehicle repair booths or spaces located in a room or area protected by an automatic sprinkler system shall have the protection extended to include the inside of the motor vehicle repair booth or space in accordance with the applicable building code.

**Withdrawn**

**2311.8.7**

**Recommendation:** Fire extinguishers. Portable fire extinguishers complying with Section 906 shall be provided and maintained for motor vehicle repair rooms, motor vehicle repair booths or motor vehicle repair spaces.

**CONSENSUS APPROVED**

**2311.8.8**

**Recommendation:** Exhaust ventilation system. Repair garages used for the repair of CNG, LNG, or other lighter-than-air motor fuels other than hydrogen shall be maintained and operated with an approved mechanical ventilation system. The mechanical exhaust ventilation system shall be in accordance with the applicable building code and Sections 2311.8.8.1 and 2311.8.8.2. Exception: Where approved by the fire code official, natural ventilation shall be permitted in lieu of mechanical exhaust ventilation.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Exhaust ventilation system. Where required by the applicable building code, repair garages used for the repair of CNG, LNG, or other lighter-than-air motor fuels other than hydrogen shall be maintained and operated with an approved mechanical ventilation system. The mechanical exhaust ventilation system shall be**

in accordance with the applicable building code and Sections 2311.8.8.1 and 2311.8.8.2.

Where approved by the applicable building code, natural ventilation shall be permitted in lieu of mechanical exhaust ventilation

### **2311.8.8.2**

**Recommendation:** 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 Sections 2311.8.9 through 2311.8.9.2.
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 ventilation system is electrically interlocked with the lighting circuit.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Operation.** Where required by the applicable building code, 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 Sections 2311.8.9 through 2311.8.9.2.
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 ventilation system is electrically interlocked with the lighting circuit.

### **2311.8.9**

**Recommendation:** Gas detection system. Repair garages used for repair of vehicles fueled by nonodorized gases including, but not limited to, hydrogen and nonodorized LNG, shall maintain a gas detection system that complies with the applicable building code. 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 maintained and operated in such pits.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Gas detection system.** Where required by the applicable building code, repair garages used for repair of vehicles fueled by nonodorized gases including, but not limited to, hydrogen and nonodorized LNG the gas detection system shall be maintained. Where lubrication or chassis service pits are provided in garages used for repairing nonodorized LNG-fueled vehicles, gas sensors shall be maintained and operated in such pits.

### **2311.8.9.1**

**Recommendation:** System activation. Where provided in accordance with the applicable building code, activation of the gas detection alarm shall be maintained and operated to result in all of the following:

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

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **System activation. Required systems shall be maintained and operated as approved to result in all of the following if required by the applicable building code:**
  1. **Initiation of local audible and visual alarms in approved locations.**
  2. **Deactivation of heating systems located in the repair garage.**
  3. **Activation of the mechanical exhaust ventilation system, where the ventilation system is interlocked with gas detection.**

**2311.8.9.2**

**Recommendation:** Failure of the gas detection system. Unless otherwise permitted by the applicable building code, failure of the gas detection system shall automatically deactivate the heating system, activate 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.

**CONSENSUS APPROVED**

**2311.8.10**

**Recommendation:** Classified electrical area. Areas within 18 inches (450 mm) of a ceiling within a motor vehicle repair room or motor vehicle repair booth shall be in accordance with the requirements for Class I, Division 2 classified locations, as set forth in NFPA 70 and the applicable building code.

Exceptions:

1. Rooms with exhaust ventilation of not less than 1 cubic foot per minute per square foot (0.3 m<sup>3</sup>/ min/m<sup>2</sup>) of floor area, with suction taken from a point within 18 inches (450 mm) of the highest point in the ceiling in repair garages for vehicles that use CNG, liquefied natural gas (LNG) or other lighter-than-air motor fuels.
2. Rooms used for the repair of hydrogen-fueled vehicles that have an approved exhaust ventilation system in accordance with the International Mechanical Code and NFPA 2.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Classified electrical area. Classified electrical areas within 18 inches (450 mm) of a ceiling, shall be maintained in accordance with the applicable building code and free of electrical hazards.**

### **2311.8.11**

**Recommendation:** Defueling equipment required at vehicle maintenance and repair facilities. Facilities for repairing or replacing hydrogen fuel tanks on hydrogen-fueled vehicles shall have equipment to defuel vehicle storage tanks. Where work must be performed on a vehicle's fuel storage tank for the purpose of maintenance, repair or cylinder certification, defueling and purging shall be conducted in accordance with Section 2309.6 and NFPA 2.

### **CONSENSUS APPROVED**

### **3105.1**

**FSB Comments:** This is new language for the 2018 IFC which defines a temporary special event structure as one that is not regulated by the building code.

**Recommendation:** General. Temporary special event structures shall comply with Sections 3104, 3105.2 through 3105.9 and ANSI E1.21

### **Withdrawn**

### **2403.2.1**

**FSB Comments:** Regulation of ignition sources is most commonly an operational is about equipment and arrangements, not permanent construction. In order to control the ignition and personnel hazards of electrical wiring and equipment, they must meet the requirements of NFPA 70. Those requirements are found in Article 516 of NFPA 70 for areas in and around the spraying equipment, which places restrictions on the use of portable electric lamps.

**Recommendation:** Electrical wiring and equipment. Electrical wiring and equipment shall be maintained in accordance with this chapter, chapter 6 and NFPA 70.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Electrical wiring and equipment. Electrical wiring and equipment shall be maintained in accordance with this chapter, the applicable building code, the applicable provisions of NFPA 70 and Chapter 6 of this code.**

### **2403.2.1.1**

**FSB Comments:** Classification of areas is an operational requirement that may evolve over the lifespan of a facility. The areas where flammable vapors [defined as flammable constituents in air that exceed 25 percent of the lower flammable limit (LFL)] are present must meet the requirements for Class I, Division 1 hazardous locations. The areas where combustible residues (such as dusts or deposits) are present must meet the requirements for the Class II, Division 1 (for dusts and residue) electrical classification.

**Recommendation:** Flammable vapor areas. Electrical wiring and equipment in flammable vapor areas shall be of an explosion proof type approved for use in such hazardous locations as

classified by the applicable building code and maintained in accordance with NFPA 70, and chapter 6.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Flammable vapor areas. Electrical wiring and equipment in flammable vapor areas shall be of an explosion proof type approved for use in such hazardous locations as classified by the applicable building code, and shall be maintained in accordance with the applicable provisions of NFPA 70 and Chapter 6 of this code.**

**2403.2.1.2**

**FSB Comments:** Residues and overspray are a result of operations, not construction. It is critical that only specifically approved electrical equipment be allowed in spraying spaces where deposits of combustible residues may readily accumulate.

**Recommendation:** Areas subject to deposits of residues. Electrical equipment, flammable vapor areas or drying operations that are subject to splashing or dripping of liquids shall be specifically approved for locations containing deposits of readily ignitable residue and explosive vapors.

Exceptions:

1. This provision shall not apply to wiring in rigid conduit, threaded boxes or fittings not containing taps, splices or terminal connections.
2. This provision shall not apply to electrostatic equipment allowed by Section 2407. In resin application areas, electrical wiring and equipment that is subject to deposits of combustible residues shall be listed for such exposure and shall be installed as required for hazardous (classified) locations. Electrical wiring and equipment not subject to deposits of combustible residues shall be installed as required for ordinary hazard locations.

**CONSENSUS APPROVED**

**2403.2.1.3**

**FSB Comments:** Designation of hazardous areas can change depending on the type and scale of operation. This is an operational requirement that needs guidance during the lifetime of the facility.

**Recommendation:** Areas adjacent to spray booths. Electrical wiring and equipment located outside of, but within 5 feet (1524 mm) horizontally and 3 feet (914 mm) vertically of openings in a spray booth or a spray room, shall be approved for hazardous locations in accordance with the applicable building code and maintained in accordance with NFPA 70 and Chapter 6.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Areas adjacent to spray booths. Unless otherwise approved by the applicable building code, electrical wiring and equipment located outside of, but within 5 feet (1524 mm) horizontally and 3 feet (914 mm) vertically of openings in a spray booth or a spray room, shall be approved for hazardous locations.**

### **2403.2.5**

**FSB Comments:** Static electricity is one of the most insidious and most common of all ignition sources. According to D.R. Scarborough in 2003, static sparks are the most common ignition sources involving spray-finishing operations. Additionally, humans are conductors of electricity, meaning that operators must also be considered when grounding systems are determined.

**Recommendation:** Grounding. Metal parts of spray booths, exhaust ducts and piping systems conveying Class I or II liquids shall be electrically grounded in accordance with NFPA 70. Metallic parts located in resin application areas, including but not limited to exhaust ducts, ventilation fans, spray application equipment, workpieces and piping, shall be electrically grounded.

### **CONSENSUS APPROVED**

### **2404.2**

**FSB Comments:** Regulates the location of spray finishing operations to reduce risk. Not construction. In the listed occupancy groups, separating spray-finishing operations from other portions of the building and protecting those portions from spraying-associated hazards are critical for several reasons. Spray finishing operations are generally too hazardous to be conducted in occupancies with a high life or property exposure.

**Recommendation:** Location of spray-finishing operations. Spray finishing operations shall not be conducted in buildings used for Group A, E, I or R occupancies except where approved in accordance with the applicable building code. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or spraying space approved for such use.

Exceptions:

1. Automobile undercoating spray operations and spray-on automotive lining operations conducted in areas with approved natural or mechanical ventilation shall be exempt from the provisions of Section 2404 when approved and where utilizing Class IIIA or IIIB combustible liquids.
2. In buildings other than Group A, E, I or R occupancies, approved limited spraying space in accordance with Section 2404.9.
3. Resin application areas used for manufacturing of reinforced plastics complying with Section 2409 shall not be required to be located in a spray room, spray booth or spraying space.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Location of spray-finishing operations. Unless otherwise approved by the applicable building code, spray finishing operations shall not be conducted in buildings used for Group A, E, I or R occupancies except where approved in accordance with the applicable building code. In other occupancies, spray-finishing operations shall be conducted in a spray room, spray booth or spraying space approved for such use where required by the applicable building code.**

**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**

**FSB Comments:** Restores reference to the applicable building code for construction of spray rooms, booths and spaces. Also provides editorial language for the subsequent subsections.

**Recommendation:** Design and construction. Design and construction of spray rooms, spray booths and spray spaces shall be in accordance with the applicable building code. These area shall be maintained in accordance with Sections 2404.3 through 2404.3.3.1.

**CONSENSUS APPROVED**

### **2404.3.1**

**FSB Comments:** Changes construction language to maintenance language for spray rooms.

**Recommendation:** Spray rooms. Spray rooms shall be maintained in accordance with this section and remain in accordance with the applicable building code.

**CONSENSUS APPROVED**

### **2404.3.1.1**

**FSB Comments:** Floor covering is not construction. In spray rooms, noncombustible floors would be the preferred type of floor construction so as not to contribute to the fuel load available to an unwanted fire. However, if the floor is not noncombustible, noncombustible and nonsparking material must be used to cover the floor. Kraft paper and similar coverings are commonly used in spraying spaces to protect against overspray.

**Recommendation:** Floor. Combustible floor construction in spray rooms shall be covered by approved, noncombustible, nonsparking material, except where combustible coverings, including but not limited to thin paper or plastic and strippable coatings, are utilized over noncombustible materials to facilitate cleaning operations in spray rooms.

**CONSENSUS APPROVED**

### **2404.3.2**

**FSB Comments:** Sections 2404.3.2.1 through 2404.3.2.6 and 2404.4 through 2404.8 and NFPA 33 contain requirements for controlling hazards associated with spray booths. Much of the hazard prevention and mitigation of flammable-finish fires in a spray booth depend on the proper construction and design of the spray booth.

**Recommendation:** Spray booths. The design and construction of spray booths shall be in accordance with the applicable building code and maintained in accordance with section 2404.3.2.2 through 2403.3.2.5 and 2304 through 2304.8 and NFPA 33.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Spray booths. The design and construction of spray booths shall be in accordance with the applicable building code and maintained in accordance with section 2404.3.2.2 through 2403.3.2.5 and 2304 through 2304.8 and the applicable sections of NFPA 33.**

### **2404.3.2.2**

**FSB Comments:** Maintenance of surfaces is not construction. Rough, corrugated or uneven surfaces are difficult to clean. Periodic cleaning of the interior surfaces reduces the fire hazard posed by the accumulation of flammable or combustible coatings. Because flammable or combustible vapors and dusts are typically heavier than air, design considerations should include the passage of exhaust air and proper air circulation to all parts of the spray booth, especially at or near the floor level.

**Recommendation:** Surfaces. The interior surfaces of spray booths shall be smooth; shall be maintained so as to permit the free passage of exhaust air from all parts of the interior, and to facilitate washing and cleaning; and shall be maintained to confine residues within the booth. Aluminum shall not be used unless approved by the applicable building code.

#### **CONSENSUS APPROVED**

### **2404.3.2.3**

**FSB Comments:** Floor covering is not construction. In spray booths, noncombustible floors would be the preferred type of floor construction so as not to contribute to the fuel load available to an unwanted fire. However, if the floor is not noncombustible, noncombustible and nonsparking material must be used to cover the floor.

**Recommendation:** Floor covering. Combustible floor construction in spray booths shall be covered by approved, noncombustible, nonsparking material, except where combustible coverings, including but not limited to thin paper or plastic and strippable coatings, are utilized over noncombustible materials to facilitate cleaning operations in spray booths.

#### **CONSENSUS APPROVED**

#### **2404.3.2.4**

**FSB Comments:** Add the reference back to Chapter 10 for egress maintenance.

**Recommendation:** Means of egress. Means of egress shall be maintained in accordance with the applicable building code and Chapter 10.

#### **CONSENSUS APPROVED**

#### **2404.3.2.5**

**FSB Comments:** Restores the exceptions which were deleted. The topic is housekeeping and not construction. Spray booths are viewed as equipment where accessibility is essential to cleaning and maintenance. This section is also included for housekeeping reasons, and to keep combustible debris and materials away from the spray booth to reduce the chances of an ignition on its exterior from a fire that might occur within the booth.

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

Exceptions: If approved in accordance with the applicable building code,

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.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Clear space. Spray booths shall be maintained so that all parts of the booth are readily accessible for cleaning. Unless otherwise approved by the applicable building code, 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. If approved in accordance with the applicable building code, the following exceptions may apply:**
  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.**

### **2404.3.3**

**FSB Comments:** Restores the references to the subsections.

**Recommendation:** Spraying spaces. Spraying spaces shall be designed and constructed in accordance with the applicable building code and maintained in accordance with Section 2404.3.3.1 and Sections 2404.4 through 2404.8 of this code.

Change proposal number to 2404.3.4

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **2404.3.4 Spraying spaces. The design and construction of spray booths shall be in accordance with the applicable building code and maintained in accordance with Section 2404.3.3.1 and Sections 2404.4 through 2404.8 of this code.**

### **2404.3.3.1**

**FSB Comments:** Floor covering is not construction. The spray-booth floor requirements in this section parallel those for spray rooms in Section 2404.3.1.1 and spray booths in Section 2404.3.2.3

**Recommendation:** Floor covering. Combustible floor construction in spraying spaces shall be covered by approved, noncombustible, nonsparking material, except where combustible coverings, such as thin paper or plastic and strippable coatings, are utilized over noncombustible materials to facilitate cleaning operations in spraying spaces.

#### **CONSENSUS APPROVED**

### **2404.4**

**FSB Comments:** Automatic sprinkler protection is the preferred method of protection for spray booths and spray rooms where the building is otherwise sprinklered. In nonsprinklered buildings that contain spray booths and spray rooms, alternative automatic fire-extinguishing systems, such as clean agents, carbon dioxide, dry chemical, etc., are allowed to be installed when approved by the fire code official.

**Recommendation:** Fire protection. Unless otherwise permitted by the applicable building code, spray booths and spray rooms shall be protected by an approved automatic fire-extinguishing system complying with the requirements of the applicable building code and maintained in accordance with Chapter 9.

#### **CONSENSUS APPROVED**

### **2404.6.2.1**

**FSB Comments:** Not construction. The surface of incandescent bulbs, halogen lamps and other light fixtures (luminaires) often exceeds the ignition temperature of common flammable and combustible liquids. Separation of light fixtures (luminaires) from the glazing will help reduce the surface temperature on the unexposed side of the glass. Glass panels must be designed, arranged and protected to ease cleaning and prevent breakage.

**Recommendation:** Glass panels. Panels for luminaires or for observation shall maintain seals to confine vapors, mists, residues, dusts and deposits to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 200°F (93°C).

**CONSENSUS APPROVED**

### **2404.6.2.2**

**FSB Comments:** External luminaires can change over the life span of a facility. Safety features, such as ventilation and separation using vapor-tight glass panels, allow for the use of ordinary light fixtures (luminaires) that are not electrically classified for hazardous locations. To maintain the integrity of the separation (that is, vapor-tight glass panels and installation outside of the classified area), these light fixtures (luminaires) must be serviced from outside the spraying area.

**Recommendation:** Exterior luminaires. Luminaires attached to the walls or ceilings of a flammable vapor area, but outside of any classified area and separated from the flammable vapor areas by vapor-tight glass panels, shall be suitable for use in ordinary hazard locations. Such luminaires shall be serviced from outside the flammable vapor areas.

**CONSENSUS APPROVED**

### **2404.6.2.3**

**FSB Comments:** Restores reference to listing in accordance with the applicable building code and suitable for accumulations of deposits/residues which are operational concerns.

**Recommendation:** Integral luminaires. Luminaires that are an integral part of the walls or ceiling of a flammable vapor area are allowed to be separated from the flammable vapor area by glass panels that are an integral part of the luminaire. Such luminaires shall be used only if listed for use in hazardous locations in accordance with the applicable building code and also shall be suitable for accumulations of deposits of combustible residues. Such luminaires are allowed to be serviced from inside the flammable vapor area.

**CONSENSUS APPROVED**

### **2404.7**

**FSB Comments:** Provides scoping language for the following subsections.

**Recommendation:** Ventilation. Mechanical ventilation of flammable vapor areas shall be maintained in accordance with this section and remain in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation. Mechanical ventilation of flammable vapor areas shall be maintained and operated in accordance with the applicable building code.**

**2404.7.2**

**FSB Comments:** Restores a key operational prohibition and provides exceptions for reference. The prohibition of recirculation in this section is specifically directed to the concern that exhaust system makeup air does not add to the fire hazard of the spraying space.

**Recommendation:** Recirculation. Air exhausted from spraying operations shall not be recirculated. Exceptions:

1. Air exhausted from spraying operations is allowed to be recirculated as makeup air for unmanned spray operations, provided that:
  - 1.1. The solid particulate has been removed.
  - 1.2. The vapor concentration is less than 25 percent of the LFL.
  - 1.3. Approved equipment is used to monitor the vapor concentration.
  - 1.4. When the vapor concentration exceeds 25 percent of the LFL, the following shall occur:
    - a. An alarm shall sound; and
    - b. Spray operations shall automatically shut down.
  - 1.5. In the event of shutdown of the vapor concentration monitor, 100 percent of the air volume specified in Section 510 of the International Mechanical Code is automatically exhausted.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Recirculation. Air exhausted from spraying operations shall not be recirculated unless otherwise permitted by the applicable building code.**

**2404.7.3.1**

**FSB Comments:** Restores the words "air velocity" to indicate what specifically must be maintained. To help keep flammable vapors in a designated spraying space and limit the amount of overspray, the code requires that the exhaust system be adequately sized to maintain an average velocity over the open face of the booth or booth cross section.

**Recommendation:** Open-face or open-front spray booth. For spray application operations conducted in an open-face or open-front spray booth, the ventilation system air velocity shall be maintained in accordance with the requirements of the applicable building code.

**CONSENSUS APPROVED**

### **2404.7.3.2**

**FSB Comments:** Restores the words "air velocity" to indicate what specifically must be maintained. To help keep flammable vapors in a designated spraying space and limit the amount of overspray, the code requires that the exhaust system be adequately sized to maintain an average velocity over the open face of the booth or booth cross section.

**Recommendation:** Enclosed spray booth or spray room with openings for product conveyance. For spray application operations conducted in an enclosed spray booth or spray room with openings for product conveyance, the ventilation system air velocity shall be maintained in accordance with the requirements of the applicable building code.

**CONSENSUS APPROVED**

### **2404.7.6**

**FSB Comments:** Clarifies that distances less than those listed in this section shall be evaluated by the building official for compliance in accordance with the applicable building code. This section details the requirements for safe outlets/ termination points of exhaust ducts conveying spray finish operation effluent. This section gives distances that must be maintained, depending on the type of exhaust, and is consistent most applicable building codes.

**Recommendation:** Termination point. Unless otherwise permitted by the applicable building code, the termination point for exhaust ducts discharging to the atmosphere shall be maintained to be not less than the distances listed below. Termination locations at less than these distances shall be evaluated by the building official for compliance in accordance with the applicable building code.

1. Ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from the lot line; 10 feet (3048 mm) from openings into the building; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls or openings into the building that are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.
2. Other product-conveying outlets: 10 feet (3048 mm) from the lot line; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from openings into the building; 10 feet (3048 mm) above adjoining grade.

**CONSENSUS APPROVED**

### **2404.7.8**

**FSB Comments:** Filters are not construction. Spray-booth and ventilation system design should effectively enclose spray operations. To prevent exhausting contaminated vapors into the atmosphere and to prevent accumulation of overspray and residue on duct surfaces and at the duct discharge location, filters must be maintained ahead of the exhaust ventilation systems from spraying spaces.

**Recommendation:** Filters. Air intake filters that are part of a wall or ceiling assembly shall be listed as Class I or II in accordance with UL 900. Exhaust filters shall be required.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Filters.** Unless otherwise approved by the applicable building code, air intake filters that are part of a wall or ceiling assembly shall be listed as Class I or II in accordance with UL 900. Exhaust filters shall be provided where required by the applicable building code.

**2404.7.8.1**

**FSB Comments:** This is not construction but restores expectation of non-combustible materials. This section is intended to minimize the combustible materials in a spray booth. The area near a filter that is used or partially used is very susceptible to ignition.

**Recommendation:** Supports. Supports and holders for filters shall be maintained as noncombustible materials unless otherwise approved by the applicable building code.

**CONSENSUS APPROVED**

**2404.7.8.3**

**FSB Comments:** Maintenance of equipment, not construction. Maintaining air velocities is critical in maintaining a safe environment outside the spraying space, as well as proper collection of flammable vapors and dusts within the spraying space. If air velocities that the exhaust system is designed for are not maintained, the spray booth operator must be made aware of this malfunction.

**Recommendation:** Maintaining air velocity. Where provided, visible gauges, audible alarms or pressure-activated devices shall be maintained to indicate or ensure that the required air velocity is maintained.

**CONSENSUS APPROVED**

**2404.7.8.4**

**FSB Comments:** Not construction but rather an operational control on automatic equipment. IF a system has automatic equipment, that the equipment must be maintained to operate properly and not modified. In the case of roll-type filters, fresh filter material is advanced into the air stream when the air velocity is reduced.

**Recommendation:** Filter rolls. Unless otherwise permitted by the applicable building code, where spray booths are equipped with a filter roll that is automatically advanced it shall be arranged to shut down the spraying operation if the filter roll fails to advance automatically.

**CONSENSUS APPROVED**

**2404.7.8.7**

**FSB Comments:** Maintaining equipment to prevent excessive residue/deposits is operational not construction. Waterwash booths are typically used for high-volume paint and lacquer usage. Many paints and lacquers are susceptible to spontaneous heating and combustion when left in a poorly ventilated or enclosed area.

**Recommendation:** Waterwash spray booths. Waterwash spray booths shall be maintained so as to prevent excessive accumulation of deposits in ducts and residue at duct outlets. Such booths shall be maintained so that air and overspray are drawn through a continuously flowing water curtain before entering an exhaust duct to the building exterior.

## **CONSENSUS APPROVED**

### **2404.8**

**FSB Comments:** Adds the words "fully operational" to indicate the expected status of the system if so equipped.

**Recommendation:** Interlocks. Interlocks for spray application finishes shall be maintained fully operational and remain in accordance with the applicable building code.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Interlocks. Interlocks for spray application finishes shall be maintained fully operational in accordance with the applicable building code.**

### **2404.8.1**

**FSB Comments:** Changed from construction language to maintenance language. An interlock is a practical solution to avoid a fire situation in which the automated system would allow for a "moving fire" as the pieces within the automated assembly move through the spraying space. The interlock would stop the spray application, which would further contribute to the flammable fuel/vapors, and prevent a moving fire from spreading faster and farther than expected.

**Recommendation:** Automated spray application operations. Where protecting automated spray application operations, automatic fire-extinguishing systems with an approved interlock feature shall maintain that feature such that, upon discharge of the system, it will automatically stop the spraying operations and workpiece conveyors into and out of the flammable vapor areas. Where the building is equipped with a fire alarm system, discharge of the automatic fire-extinguishing system shall be maintained to activate the building alarm notification appliances in accordance with the applicable building code.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Automated spray application operations. Unless otherwise permitted by the applicable building code, where protecting automated spray application operations, automatic fire-extinguishing systems with an approved interlock feature shall maintain that feature such that, upon discharge of the system, it will automatically stop the spraying operations and workpiece conveyors into and out of the**

**flammable vapor areas. Where the building is equipped with a fire alarm system, discharge of the automatic fire-extinguishing system shall be maintained to activate the building alarm notification appliances in accordance with the applicable building code.**

#### **2404.8.1.1**

**FSB Comments:** Added operational terms "accessible" and "fully operational" In case the operator of a spraying area becomes aware of a fire prior to the actuation of the extinguishing system, or in case there is an emergency not related to a fire where there is a risk to the occupants of the building, a manual fire alarm station is needed.

**Recommendation:** Alarm station. Where required, a manual fire alarm and emergency system shutdown station shall be maintained accessible, fully operational and remain in accordance with the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Alarm station. Where required, a manual fire alarm and emergency system shutdown station shall be maintained accessible and fully operational in accordance with the applicable building code.**

#### **2404.8.2**

**FSB Comments:** Restores an important operational prohibition against interlocking ventilation shutdown. Exhaust ventilation of flammable vapors and smoke during a fire may help reduce the fire severity and increase visibility.

**Recommendation:** Ventilation interlock prohibited. Unless otherwise permitted by the applicable building code, air makeup and flammable vapor area exhaust systems shall not be interlocked with the fire alarm system and shall remain in operation during a fire alarm condition. Exception: Where permitted by the applicable building code such as where the type of fire-extinguishing system used requires such ventilation to be discontinued and dampers close.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation interlock prohibited. Unless otherwise permitted by the applicable building code, air makeup and flammable vapor area exhaust systems shall not be interlocked with the fire alarm system and shall remain in operation during a fire alarm condition.**

**Exception: Where the applicable building code requires such ventilation to be discontinued and dampers closed.**

#### **2405.2**

**FSB Comments:** Operational requirement, not construction, to regulate where dip-tank operations are hazardous and should not be conducted. Separation and protection from hazards of other portions of a building housing the occupancy groups listed in this section are critical for

several reasons. Dipping and coating processes are too hazardous to be conducted in occupancies with a high life or property exposure.

**Recommendation:** Location of dip-tank operations. Dip-tank operations conducted in buildings used for Group A, I or R occupancies shall be located in a room designed for that purpose, equipped with an approved automatic sprinkler system and separated vertically and horizontally from other areas in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Location of dip-tank operations. Where required by the applicable building code, dip-tank operations conducted in buildings used for Group A, I or R occupancies shall be located in a room designed for that purpose, equipped with an approved automatic sprinkler system and separated vertically and horizontally from other areas in accordance with the applicable building code.**

**2405.3**

**FSB Comments:** Dip tank operations are not necessarily fixed processes that require building permits. The selection of materials and design of dipping and coating processes must consider the physical properties of the liquid and the processing environment.

**Recommendation:** Construction of dip tanks. Unless regulated by the applicable building code, dip tanks shall be constructed in accordance with Sections 2405.3.1 through 2405.3.4.3 and NFPA 34. Dip tanks, including drain boards, shall be constructed of noncombustible material and their supports shall be of heavy metal, reinforced concrete or masonry.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Construction of dip tanks. Dip tanks shall be constructed in accordance with Sections 2405.3.1 through 2405.3.4.3 and NFPA 34. Dip tanks, including drain boards, shall be constructed of noncombustible material and their supports shall be of heavy metal, reinforced concrete or masonry unless otherwise approved by the applicable building code.**

**2405.3.1**

**FSB Comments:** This section highlights a requirement for proper drainage of large tanks and directs compliance in accordance with the applicable building code. An overflow drain is required for tanks with capacities greater than 150 gallons (568 L) or having a surface area greater than 10 square feet (0.93 m<sup>2</sup>) to confine spills or uncontrolled releases caused by overfilling or overflowing when parts are immersed.

**Recommendation:** Overflow. To operate dip tanks greater than 150 gallons (568 L) in capacity or 10 square feet (0.93 m<sup>2</sup>) in liquid surface area, they shall be equipped with a trapped overflow pipe leading to an approved location outside the building in accordance with the building code.

**CONSENSUS APPROVED**

### **2405.3.2**

**FSB Comments:** This section highlights special requirements for large tanks and directs compliance in accordance with the applicable building code. Emergency release drains permit flammable liquids in dip tanks to be safely discharged if a fire occurs. A trap between the drain opening and the separator or salvage tank reduces the likelihood that the fire will flash back into the tank.

**Recommendation:** Bottom drains. Unless otherwise permitted by the applicable building code, dip tanks greater than 500 gallons (1893 L) in liquid capacity shall only be operated 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 continue to be from a safe, accessible location. Such drains shall be trapped and discharged to a closed, vented salvage tank or to an approved outside location in accordance with the applicable building code.

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.

### **CONSENSUS APPROVED**

### **2405.4**

**FSB Comments:** Restores the term "fire protection system" to provide proper context. Also references Chapter 9 for maintenance requirements.

**Recommendation:** Fire protection. Dip tank operations shall be protected with a fire protection system in accordance with the applicable building code and maintained in accordance with Chapter 9.

### **CONSENSUS APPROVED**

### **2405.4.1**

**FSB Comments:** This section applies to fire-extinguishing equipment for certain smaller sizes of dip tanks. It offers the option of dip-tank covers instead of a fixed fire-extinguishing system. Tanks equipped with noncombustible automatic-closing covers conforming to Section 2405.3.4 need not be protected by a fire suppression system on the basis that the cover can be closed, thus containing a dip tank fire and further restricting oxygen supply to the fire.

**Recommendation:** Fixed fire-extinguishing equipment. Unless otherwise permitted by the applicable building code, an approved automatic fire-extinguishing system or dip-tank cover in accordance with Section 2405.3.4 shall be maintained for the following dip tanks:

1. Dip tanks less than 150 gallons (568 L) in capacity or 10 square feet (0.93 m<sup>2</sup>) in liquid surface area.

2. Dip tanks containing a liquid with a flash point below 110°F (43°C) used in such manner that the liquid temperature could equal or be greater than its flash point from artificial or natural causes, and having both a capacity of more than 10 gallons (37.9 L) and a liquid surface area of more than 4 square feet (0.37 m<sup>2</sup>)

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fixed fire-extinguishing equipment. Where required by the applicable building code, an automatic fire-extinguishing system or dip-tank cover shall be maintained.**

**2405.4.1.1**

**FSB Comments:** Restores clarification that tanks over 150 gallons are expected to have a fire extinguishing system.

**Recommendation:** Fire-extinguishing system. Unless otherwise permitted by the applicable building code, an approved automatic fire-extinguishing system shall be provided for dip tanks with a 150-gallon (568 L) or more capacity or 10 square feet (0.93 m<sup>2</sup>) or larger in a liquid surface area.

**CONSENSUS APPROVED**

**2405.7**

**FSB Comments:** This section includes performance-based language for dip tank operations that requires ventilation to prevent the dangerous accumulation of vapors. Additionally, conveyor systems used with dipping operations need to be interlocked with the ventilation system to avoid continuation of operations in the event of a ventilation system failure.

**Recommendation:** Ventilation of flammable vapor areas. Flammable vapor areas shall be operated with mechanical ventilation adequate to prevent the dangerous accumulation of vapors in accordance with the applicable building code. Where required, ventilation systems shall be maintained such that the failure of any ventilating fan shall automatically stop the dipping conveyor system.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation of flammable vapor areas. Mechanical ventilation in flammable vapor areas shall be operated and maintained to prevent the dangerous accumulation of vapors. Where required by the applicable building code, the failure of any ventilating fan shall automatically stop the dipping conveyor system.**

**2405.9.1**

**FSB Comments:** Dip tank operations are not necessarily fixed processes that require building permits. High temperatures produced by hardening and tempering processes require the maintenance of separation between tanks, ignition sources and combustible materials

**Recommendation:** Location. Unless otherwise required by the applicable building code, tanks shall be located as far as practical from furnaces and shall not be located on or near combustible floors.

#### **CONSENSUS APPROVED**

##### **2405.9.2**

**FSB Comments:** Housekeeping requirements for ventilation hoods and ducts. Though the materials in hardening and tempering baths are usually not considered flammable, the elevated temperatures may represent an ignition source to other combustibles. The contents of oil-quenching tanks used for high flash-point liquids may be difficult to ignite, but once ignited, the rate of heat release is comparable to other flammable and combustible liquids.

**Recommendation:** Hoods. Unless otherwise required by the applicable building code, tanks shall be operated only with a noncombustible hood and vent or other approved venting means, terminating outside of the structure to serve as a vent in case of a fire. Such vent ducts shall be treated as flues and proper clearances shall be maintained from combustible materials.

#### **CONSENSUS APPROVED**

##### **2405.9.3**

**FSB Comments:** Important operational alarm settings to maintain. Thermostats may be used to limit the heat input to the oil bath for temperature maintenance. However, many systems require cooling systems to maintain oil baths within specified temperature limitations. Water leaking from these cooling systems can pose a special hazard from boil-over as the water is converted to steam.

**Recommendation:** Alarms. Where equipped, tanks shall be operated with a high-temperature limit switch maintained to sound an alarm when the temperature of the quenching medium reaches 50°F (10°C) below the flash point or other approved level as required by the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Alarms. Tanks shall be operated with a high-temperature limit switch maintained to sound an alarm when the temperature of the quenching medium reaches 50°F (10°C) below the flash point or other approved level as required by the applicable building code.**

##### **2405.9.4**

**FSB Comments:** Tanks larger than 500 gallons (1893 L) in capacity or 25 square feet (2.3 m<sup>2</sup>) in surface area present a significant enough hazard as to be required to maintain protection by an automatic fire-suppression system

**Recommendation:** Fire protection. Unless otherwise required by the applicable building code, hardening and tempering tanks greater than 500 gallons (1893 L) in capacity or 25 square feet (2.3 m<sup>2</sup>) in liquid surface area shall be protected by an approved automatic fire-extinguishing system maintained in accordance with Chapter 9.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fire protection. Unless otherwise permitted by the applicable building code, hardening and tempering tanks greater than 500 gallons (1893 L) in capacity or 25 square feet (2.3 m<sup>2</sup>) in liquid surface area shall be protected by an approved automatic fire-extinguishing system maintained in accordance with Chapter 9.**

**2405.10.1**

**FSB Comments:** Positive displacement pumps are most commonly used to recirculate paint and coating material from the reservoir to the nozzles.

**Recommendation:** Paint supply. Unless otherwise required by the applicable building code, paint operations shall be supplied by a gravity tank not exceeding 10 gallons (38 L) in capacity or by direct low-pressure pumps arranged to shut down automatically in case of a fire by means of approved heat-actuated devices in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Paint supply. Unless otherwise permitted by the applicable building code, paint operations shall be supplied by a gravity tank not exceeding 10 gallons (38 L) in capacity or by direct low-pressure pumps arranged to shut down automatically in case of a fire by means of approved heat-actuated devices in accordance with the applicable building code.**

**2405.11**

**FSB Comments:** Restores the technical maintenance requirements for roll-coating operations. Roll-coating methods apply material to flat work pieces, usually paper, cardboard, cloth or thin metals, using liquid-coated cylinders or rollers.

**Recommendation:** Roll-coating operations. Roll-coating operations shall comply with Section 2405.10. In roll-coating operations utilizing flammable or combustible liquids, sparks from static electricity shall be prevented by electrically bonding and grounding all metallic rotating and other parts of machinery and equipment and by the installation of static collectors, or by maintaining a conductive atmosphere such as a high relative humidity.

**CONSENSUS APPROVED**

**2406.3**

**FSB Comments:** Provides guidance for illegal powder coating arrangements and provides direction back to the applicable building code for construction requirements.

**Recommendation:** Construction of powder coating rooms and booths. Powder coating rooms shall be constructed of noncombustible materials in accordance with the applicable building code. Spray booths shall be constructed in accordance with Section 2404.3.2.

Exception: Listed spray-booth assemblies that are constructed of other materials shall be allowed.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Construction of powder coating rooms and booths. The design and construction of powder coating rooms shall be in accordance with the applicable building code. Spray booths shall be constructed in accordance with Section 2404.3.2. Exception: Listed spray-booth assemblies that are constructed of other materials shall be allowed.**

**2406.4**

**FSB Comments:** Provides reference to Chapter 9 for maintenance of fire protection systems.

**Recommendation:** Fire protection. Areas used for powder coating shall be protected by an approved automatic fire-extinguishing system in accordance with the applicable building code and maintained in accordance with Chapter 9.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fire protection. Where required by the applicable building code automatic fire-extinguishing system shall be maintained in accordance with Chapter 9.**

**2406.6.4**

**FSB Comments:** Restores technical language for grounding and bonding requirements. Static electricity is one of the most insidious and most common of all ignition sources. According to D.R. Scarborough in 2003, static sparks are the most common ignition sources involving spray-finishing operations.

**Recommendation:** Grounding and bonding. Precautions shall be taken to minimize the possibility of ignition by static electrical sparks through static bonding and grounding, where possible, of powder transport, application and recovery equipment.

**CONSENSUS APPROVED**

**2406.7**

**FSB Comments:** Restores critical technical thresholds for effective system operations. Powder coating creates explosive atmospheres because of the large surface areas of the particles when dispersed in the air. The explosive limit or concentration, just as with flammable vapors, will depend on the type of material being used.

**Recommendation:** Ventilation. Exhaust ventilation shall be sufficient to maintain the atmosphere below one-half the minimum explosive concentration for the material being applied. Nondeposited, air-suspended powders shall be removed through exhaust ducts to the powder recovery system.

## **CONSENSUS APPROVED**

### **2407.2**

**FSB Comments:** Restores technical requirements that not only maintain the level of safety required by the IFC but also define the clear space in more detail. It also restores the exception for listed portable equipment. The change in the 2015 version significantly reduced the level of safety required by the IFC.

**Recommendation:** Location and clear space. A space of at least twice the sparking distance shall be maintained between goods being painted or deteared and electrodes, electrostatic atomizing heads or conductors. A sign stating the sparking distance shall be conspicuously posted near the assembly.

Exception: Portable electrostatic paint-spraying apparatus listed for use in Class I, Division 1, locations.

## **CONSENSUS APPROVED**

### **2407.3**

**FSB Comments:** Restores maintenance language for critically important equipment that must remain as required by the applicable building code.

**Recommendation:** Construction of equipment. Electrodes and electrostatic atomizing heads shall be maintained of approved construction, rigidly supported in permanent locations and effectively insulated from ground. Insulators shall be nonporous and noncombustible.

Exception: Portable electrostatic paint-spraying apparatus listed for use in Class I, Division 1, locations.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Construction of equipment. Electrodes and electrostatic atomizing heads shall be maintained in accordance with the applicable building code. Portable electrostatic paint-spraying apparatus shall be listed for use in Class I, Division 1, locations.**

### **2407.3.1**

**FSB Comments:** Restores technical provisions for maintaining guards or barriers. Key expectations about conductive material, grounding, etc. are noted to ensure that illegal modifications are identified. Also restores the exception for listed portable equipment.

**Recommendation:** Barriers. Booths, fencing, railings or guards shall be maintained about the equipment such that either by their location or character, or both, isolation of the process is maintained from plant storage and personnel. Railings, fencing and guards shall be of conductive material, adequately grounded, and at least 5 feet (1524 mm) from processing equipment in accordance with the applicable building code.

Exception: Portable electrostatic paint-spraying apparatus listed for use in Class I, Division 1, locations.

## **CONSENSUS APPROVED**

### **2407.4**

**FSB Comments:** Provides reference to Chapter 9 for fire protection system maintenance.

**Recommendation:** Fire protection. Areas used for electrostatic spray finishing with fixed equipment shall be protected with an approved automatic fire-extinguishing system and maintained in accordance with Chapter 9.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fire protection. Approved automatic fire-extinguishing systems shall be maintained in accordance with Chapter 9.**

### **2407.4.1**

**FSB Comments:** Restores technical requirements and expectations for automated equipment. Automated liquid electrostatic spray application may or may not have operators who would take steps to reduce the severity of the fire, such as shutting down the supply of coating material, warning occupants for evacuation purposes, etc. The flame detection system and its associated interlocks are part of the protection system, in case ignition has already occurred.

**Recommendation:** Protection for automated liquid electrostatic spray application equipment. Where provided, automated liquid electrostatic spray application equipment shall maintain an approved, supervised flame detection apparatus that shall, in the event of ignition, react to the presence of flame and shall accomplish all of the following unless otherwise required by the applicable building code:

1. Activation of a local alarm in the vicinity of the spraying operation and activation of the building alarm system, if such a system is provided.
2. Shutting down of the coating material delivery system.
3. Termination of all spray application operations.
4. Stopping of conveyors into and out of the flammable vapor areas.
5. Disconnection of power to the high-voltage elements in the flammable vapor areas and disconnection of power to the system.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Protection for automated liquid electrostatic spray application equipment.** Where required by the applicable building code, automated liquid electrostatic spray application equipment shall maintain an approved, supervised flame detection apparatus that shall, in the event of ignition, react to the presence of flame and shall accomplish all of the following if required by the applicable building code:
  1. **Activation of a local alarm in the vicinity of the spraying operation and activation of the building alarm system, if such a system is provided.**
  2. **Shutting down of the coating material delivery system.**
  3. **Termination of all spray application operations.**
  4. **Stopping of conveyors into and out of the flammable vapor areas.**
  5. **Disconnection of power to the high-voltage elements in the flammable vapor areas and disconnection of power to the system.**

### **2407.8**

**FSB Comments:** Restores technical requirements and expectations for emergency shutdowns. The required interlocks reduce the likelihood of the apparatus igniting flammable vapors in the event of any of the specified conditions.

**Recommendation:** Emergency shutdown. Where provided, electrostatic apparatus shall be maintained with automatic controls operating without time delay to disconnect the power supply to the high-voltage transformer and signal the operator under any of the following conditions unless otherwise required by the applicable building code:

1. Stoppage of ventilating fans or failure of ventilating equipment from any cause.
2. Stoppage of the conveyor carrying articles past the high-voltage grid.
3. Occurrence of a ground or an imminent ground at any point of the high-voltage system.
4. Reduction of clearance below that required in Section 2407.2.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Emergency shutdown.** Where emergency shutdowns are required by the applicable building code such devices shall be maintained with automatic controls operating without time delay to disconnect the power supply to the high-voltage transformer and signal the operator under any of the following conditions unless otherwise permitted by the applicable building code:
  1. **Stoppage of ventilating fans or failure of ventilating equipment from any cause.**
  2. **Stoppage of the conveyor carrying articles past the high-voltage grid.**
  3. **Occurrence of a ground or an imminent ground at any point of the high-voltage system.**
  4. **Reduction of clearance below that required in Section 2407.2.**

### **2407.9**

**FSB Comments:** This important requirement has not changes since at least the 1978 BOCA. The required interlock is intended to prevent the use of hand sprayers without ventilation equipment in operation. Failure to operate exhaust ventilation may lead to the creation of ignitable vapor concentration in the spraying space.

**Recommendation:** Ventilation interlock. Unless otherwise permitted by the applicable building code, hand electrostatic equipment shall be maintained as interlocked with the ventilation system for the spraying area so that the equipment cannot be operated unless the ventilating system is in operation.

**CONSENSUS APPROVED**

**2408.2**

**FSB Comments:** Proper use/location is a critical operational requirement, not construction. Because of the reactivity of the material, the use of organic peroxide and other dual-component coating systems is limited to spray booths only.

**Recommendation:** Use of organic peroxide coatings. Unless otherwise required by the applicable building code, spraying operations involving the use of organic peroxides and other dual-component coatings shall be conducted in approved sprinklered spray booths complying with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Use of organic peroxide coatings. Unless otherwise permitted by the applicable building code, spraying operations involving the use of organic peroxides and other dual-component coatings shall be conducted in approved sprinklered spray booths complying with the applicable building code.**

**2409.3**

**FSB Comments:** Provides reference to Chapter 9 for maintenance of fire protection systems.

**Recommendation:** Fire protection. Areas used for spray application of resin shall be maintained with an approved automatic fire-extinguishing system in accordance with Chapter 9 and remain in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fire protection. Where required by the applicable building code automatic fire-extinguishing system shall be maintained in accordance with Chapter 9.**

**2409.6**

**FSB Comments:** Restores technical provisions for operation of ventilation systems. In many cases, acetone is used for cleanup of resin accumulations.

**Recommendation:** Ventilation. Mechanical ventilation shall be maintained throughout resin application areas in accordance with 2404.7 and remain in accordance with the building code. The ventilation rate shall be adequate to maintain the concentration of flammable vapors in the resin application area at or below 25 percent of the LFL.

Exception: Mechanical ventilation is not required for buildings that have 75 percent of the perimeter unenclosed.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation.** Mechanical ventilation shall be maintained throughout resin application areas in accordance with 2404.7 and the applicable building code. The ventilation rate shall be adequate to maintain the concentration of flammable vapors in the resin application area at or below 25 percent of the LFL unless otherwise permitted by the applicable building code.  
**Exception: Mechanical ventilation is not required for buildings that have 75 percent of the perimeter unenclosed.**

**2409.6.1**

**FSB Comments:** The use of ventilation is not a construction requirement. Ventilation in areas where personnel are present is required for fire prevention as well as for reduction of health risks.

**Recommendation:** Local ventilation. Local ventilation shall be provided inside of workpieces where personnel will be under or inside of the workpiece.

**CONSENSUS APPROVED**

**2701.1**

**FSB Comments:** Restores language that is more consistent with the IFC but not vastly different from the 2015 VSFPC. Semiconductor facilities are unique facilities that, due to their size, complex layout and the logistics of their operations, have been provided with a unique package of requirements.

**Recommendation:** The operation and maintenance of semiconductor fabrication and comparable research and development areas classified as Group H-5 shall comply with this chapter. The use, storage and handling of hazardous materials in Group H-5 shall comply with this chapter, other applicable provisions of this code and requirements of the applicable building code.

**CONSENSUS APPROVED**

**2703.1.3**

**FSB Comments:** Requirements for Semiconductor Fabrication Facilities first appeared in the 1987 BOCA Fire Prevention Code. An Emergency Control Station was defined as "An approved location on the premises of an HPM use facility, where signals for emergency equipment are received.

**Recommendation:** Signals. Unless otherwise required in accordance with the applicable building code, the emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detections systems include, but are not limited to, the following where such equipment or systems are required by the applicable building code:

1. Automatic sprinkler system alarm and monitoring systems.
2. Manual fire alarm systems.
3. Emergency alarm systems.
4. Continuous gas detection systems.
5. Smoke detection systems.
6. Emergency power system.
7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required 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 2704.2.3.4.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Signals. Unless otherwise permitted by the applicable building code, the emergency control station shall receive signals from emergency equipment and alarm and detection systems. Such emergency equipment and alarm and detections systems include, but are not limited to, the following where such equipment or systems are required by the applicable building code:**
  1. Automatic sprinkler system alarm and monitoring systems.
  2. Manual fire alarm systems.
  3. Emergency alarm systems.
  4. Continuous gas detection systems.
  5. Smoke detection systems.
  6. Emergency power system.
  7. Automatic detection and alarm systems for pyrophoric liquids and Class 3 water-reactive liquids required 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 2704.2.3.4.

**2703.2.2**

**FSB Comments:** Adds the term "applicable building code" in place of IBC and IMC. This term was NOT provided by the 2015 VSFPC.

**Recommendation:** General requirements. In addition to the requirements in Section 2703.2, systems, equipment and other processes shall also comply with Section 5003.2, other applicable provisions of this code and the applicable building code.

**CONSENSUS APPROVED**

**2703.3.2**

**FSB Comments:** Replaced the word "be" with "comply" for consistency.

**Recommendation:** Pass-through in exit access corridors. Pass-through in exit access corridors shall comply with the applicable building code.

**CONSENSUS APPROVED**

**2703.3.3**

**FSB Comments:** Restores reference to maintenance requirements of Chapter 57

**Recommendation:** Liquid storage rooms. Liquid storage rooms shall comply with Chapter 57 and the applicable building code.

**CONSENSUS APPROVED**

**2703.3.4**

**FSB Comments:** Replaced the word "be" with "comply" for consistency.

**Recommendation:** HPM rooms. HPM rooms shall comply with the applicable building code.

**CONSENSUS APPROVED**

**2703.3.5**

**FSB Comments:** There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.6.

**Recommendation:** Gas cabinets. Gas cabinets shall comply with Section 5003.8.6.

**CONSENSUS APPROVED**

**2703.3.6**

**FSB Comments:** There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.5.

**Recommendation:** Exhausted enclosures. Exhausted enclosures shall be maintained in accordance with Section 5003.8.5 and remain in accordance with the applicable building code.

**CONSENSUS APPROVED**

**2703.3.7**

**FSB Comments:** There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 5003.8.4.

**Recommendation:** Gas rooms. Gas rooms shall be maintained in accordance with Section 5003.8.4 and remain in accordance with the applicable building code.

**CONSENSUS APPROVED**

**2703.3.8**

**FSB Comments:** There are no maintenance requirements in the building code. This restores reference to the maintenance requirements of 2705.3.

**Recommendation:** Service corridors. Service corridors shall comply with Section 2705.3 and the remain in accordance with the applicable building code.

**CONSENSUS APPROVED**

**2703.7**

**FSB Comments:** Restores scoping language for the following subsections.

**Recommendation:** Electrical wiring and equipment. Electrical wiring and equipment in HPM facilities shall comply with Sections 2703.7.1 through 2703.7.3.

**CONSENSUS APPROVED**

**2703.7.1**

**FSB Comments:** Restores reference to maintenance requirements of NFPA 70.

**Recommendation:** Fabrication areas. Electrical wiring and equipment in fabrication areas shall be maintained in accordance with NFPA 70 and remain in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fabrication areas. Electrical wiring and equipment in fabrication areas shall be maintained in accordance with the applicable provisions of NFPA 70 and remain in accordance with the applicable building code.**

**2703.7.2**

**FSB Comments:** Workstations are commonly relocated and arrangements changed so it is important to have this technical information for proper classification of areas. Areas located in and around workstations are considered Class I, Division 2, hazardous locations as defined by Article 500 of NFPA 70.

**Recommendation:** Workstations. Electrical equipment and devices within 5 feet (1524 mm) of workstations in which flammable or pyrophoric gases or flammable liquids are used shall be maintained in accordance with NFPA 70 for hazardous locations. Workstations shall not be energized without adequate exhaust ventilation in accordance with Section 2703.14.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Workstations. Electrical equipment and devices within 5 feet (1524 mm) of workstations in which flammable or pyrophoric gases or flammable liquids are used shall be maintained in accordance with the applicable provisions of NFPA 70 for hazardous locations. Workstations shall not be energized without adequate exhaust ventilation in accordance with Section 2703.14.**  
**Exception: Not required when the air removal from the workstation or dilution will prevent the accumulation of flammable vapors and fumes on a continuous basis.**

**2703.7.3**

**FSB Comments:** Electrical wiring, equipment and devices in HPM cutoff rooms used for the storage of flammable liquids or gases must be classified for hazardous locations, in accordance with NFPA 70.

**Recommendation:** Hazardous production material (HPM) rooms, gas rooms and liquid storage rooms. Electrical wiring and equipment in HPM rooms, gas rooms and liquid storage rooms shall be maintained in accordance with NFPA 70 and remain in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Hazardous production material (HPM) rooms, gas rooms and liquid storage rooms. Electrical wiring and equipment in HPM rooms, gas rooms and liquid storage rooms shall be maintained in accordance with the applicable provisions of NFPA 70 and remain in accordance with the applicable building code.**

**2703.10**

**FSB Comments:** Restores the reference to Chapter 9 for maintenance of fire protection systems.

**Recommendation:** Automatic sprinkler system. An approved automatic sprinkler system shall be maintained in accordance with Chapter 9, this section and remain in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Automatic sprinkler system. Where required by the applicable building code automatic sprinkler systems shall be maintained in accordance with Chapter 9.**

**2703.10.5**

**FSB Comments:** Restores the reference to supervising sprinkler system alarms at the emergency control station if required by the applicable building code. Automatic sprinkler system alarm and supervisory signals should be transmitted to the on-site emergency control station.

**Recommendation:** Sprinkler alarms and supervision. Automatic sprinkler systems, associated electronic supervision and alarms shall be maintained in accordance with Chapter 9. Where provided, automatic sprinkler system alarm and supervisory signals shall also remain transmitted to the emergency control station in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Sprinkler alarms and supervision. Automatic sprinkler systems, associated electronic supervision and alarms shall be maintained in accordance with Chapter 9. Where required by the applicable building code, automatic sprinkler system alarm and supervisory signals shall also remain transmitted to the emergency control station.**

**2703.11**

**FSB Comments:** Provides technical requirements and expectations for manual fire alarm systems in these facilities. A manual fire alarm system activation is to set off a local alarm, with the alarm signal transmitted to the on-site emergency control station. Note that the local alarm signal is intended only for the area of alarm origin and is not intended to be a general alarm that sounds throughout the building.

**Recommendation:** Where provided, a manual fire alarm system shall be maintained in accordance with Chapter 9 and remain throughout buildings containing a Group H-5 occupancy in accordance with the applicable building code. Where provided, activation of the alarm system shall also be maintained to transmit a signal to the emergency control station.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Manual fire alarm system. Where provided, a manual fire alarm system shall be maintained in accordance with Chapter 9 and remain throughout buildings containing a Group H-5 occupancy in accordance with the applicable building code. Where required by the applicable building code, activation of the alarm system shall also be maintained to transmit a signal to the emergency control station.**

**2703.12**

**FSB Comments:** Restores the reference to Chapter 9 for maintenance of emergency alarm systems. This section requires an operational emergency alarm system in all areas where HPM is transported or stored and to transmit to the emergency control station.

**Recommendation:** Emergency alarm system. Emergency alarm systems shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code. Where provided, emergency alarm systems shall also remain transmitted to the emergency control station in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Emergency alarm system. Emergency alarm systems shall be maintained in accordance with Chapter 9 and remain in accordance with the applicable building code. Where required by the applicable building code, emergency alarm systems shall also remain transmitted to the emergency control station.**

**2703.12.1.2**

**FSB Comments:** Construction requirements.

**Recommendation:** Corridors and interior exit stairways and ramps.

**CONSENSUS TO DELETE**

**2703.12.1.3**

**FSB Comments:** Construction requirements.

**Recommendation:** Liquid storage rooms, HPM rooms and gas rooms.

**CONSENSUS TO DELETE**

**2703.13**

**FSB Comments:** Restores reference to critical thresholds to be used for detection maintenance. A gas detection system in the room or area used for the storage or use of HPM gases provides early notification of a leak before the escaping gas reaches hazardous concentration levels.

**Recommendation:** Continuous gas detection systems. Where provided, a continuous gas detection system shall be maintained for HPM gases. Such a system shall remain in accordance with the applicable building code 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.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Where required by the applicable building code, a continuous gas detection system shall be maintained for HPM gases. Such a system shall remain in accordance with the applicable building code 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.**

**2703.13.2**

**FSB Comments:** This section identifies the operational requirements for an effective gas detection system. This section harmonizes the code with the widely used clean-room standard

NFPA 318 provisions for gas detection, which are much more relevant to the type of monitoring performed in semiconductor manufacturing (inside exhausted enclosures, ventilated enclosures or gas cabinets).

**Recommendation:** Gas detection system operation. In accordance with the applicable building code, a continuous gas detection system shall be maintained capable of monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations:

1. Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.
2. Permissible exposure limit (PEL) levels when 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) when 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.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Gas detection system operation. Where required by the applicable building code, a continuous gas detection system shall be maintained capable of monitoring the room, area or equipment in which the gas is located at or below all the following gas concentrations:**

**Immediately dangerous to life and health (IDLH) values when the monitoring point is within an exhausted enclosure, ventilated enclosure or gas cabinet.**

**Permissible exposure limit (PEL) levels when the monitoring point is in an area outside an exhausted enclosure, ventilated enclosure or gas cabinet.**

**For flammable gases, the monitoring detection threshold level shall be vapor concentrations in excess of 25 percent of the lower flammable limit (LFL) when the monitoring is within or outside an exhausted enclosure, ventilated enclosure or gas cabinet.**

- **Except as noted in this section, monitoring for highly toxic and toxic gases shall also comply with Chapter 60.**

**2703.14**

**FSB Comments:** Restores the operational requirement for ventilation systems as well as reference to subsections below.

**Recommendation:** Exhaust ventilation systems for HPM. Exhaust ventilation systems and materials for exhaust ducts utilized for the exhaust of HPM shall be maintained and operated in accordance with this chapter, other applicable provisions of this code, and remain in accordance with the applicable building code.

**CONSENSUS APPROVED**

### **2703.14.1**

**FSB Comments:** Restored the references to the maintenance requirements of Chapter 50. This technology was not introduced into Virginia until the 1990s when the BOCA codes provided requirements for these facilities. These are core requirements of HPM facilities.

**Recommendation:** Operations and Maintenance of HPM areas. Exhaust ventilation systems shall be maintained in the following locations in accordance with the requirements of this section and remain in accordance with the applicable building code:

1. Fabrication areas: Exhaust ventilation for fabrication areas shall comply with the applicable building code.
2. Workstations: A ventilation system shall be maintained to capture and exhaust gases, fumes and vapors at workstations.
3. Liquid storage rooms: Exhaust ventilation for liquid storage rooms shall comply with Section 5004.3.1 and the applicable building code.
4. HPM rooms: Exhaust ventilation for HPM rooms shall comply with Section 5004.3.1 and the applicable building code.
5. Gas cabinets: Exhaust ventilation for gas cabinets shall comply with Section 5003.8.6.2. The gas cabinet ventilation system is allowed to connect to a workstation ventilation system. Exhaust ventilation for gas cabinets containing highly toxic or toxic gases shall also comply with Chapter 60.
6. Exhausted enclosures: Exhaust ventilation for exhausted enclosures shall comply with Section 5003.8.5.2. Exhaust ventilation for exhausted enclosures containing highly toxic or toxic gases shall also comply with Chapter 60.
7. Gas rooms: Exhaust ventilation for gas rooms shall comply with Section 5003.8.4.2. Exhaust ventilation for gas rooms containing highly toxic or toxic gases shall also comply with Chapter 60.
8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids: Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids shall be as required in Section 2705.2.3.4.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Operations and Maintenance of HPM areas. Exhaust ventilation systems shall be maintained in the following locations in accordance with the requirements of this section and the applicable building code:**
  1. **Fabrication areas: Exhaust ventilation for fabrication areas shall comply with the applicable building code.**
  2. **Workstations: A ventilation system shall be maintained to capture and exhaust gases, fumes and vapors at workstations.**
  3. **Liquid storage rooms: Exhaust ventilation for liquid storage rooms shall comply with Section 5004.3.1 and the applicable building code.**
  4. **HPM rooms: Exhaust ventilation for HPM rooms shall comply with Section 5004.3.1 and the applicable building code.**
  5. **Gas cabinets: Exhaust ventilation for gas cabinets shall comply with Section 5003.8.6.2. The gas cabinet ventilation system is allowed to connect to a workstation ventilation system. Exhaust ventilation for gas cabinets containing highly toxic or toxic gases shall also comply with Chapter 60.**

**6. Exhausted enclosures: Exhaust ventilation for exhausted enclosures shall comply with Section 5003.8.5.2. Exhaust ventilation for exhausted enclosures containing highly toxic or toxic gases shall also comply with Chapter 60.**

**7. Gas rooms: Exhaust ventilation for gas rooms shall comply with Section 5003.8.4.2 and the applicable building code. Exhaust ventilation for gas rooms containing highly toxic or toxic gases shall also comply with Chapter 60.**

**8. Cabinets containing pyrophoric liquids or Class 3 water-reactive liquids: Exhaust ventilation for cabinets in fabrication areas containing pyrophoric liquids or Class 3 water-reactive liquids shall be as required in Section 2705.2.3.4.**

### **2703.15**

**FSB Comments:** Restores reference to section 604 for maintenance of emergency power systems.

**Recommendation:** Emergency power system. An emergency power system shall be maintained in Group H-5 occupancies in accordance with Section 604.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Emergency power system. Where required by the applicable building code, an emergency power system shall be maintained in Group H-5 occupancies in accordance with Section 604.**

### **2703.15.1**

**FSB Comments:** This section highlights which equipment is expected to be supported by emergency power. As indicated in Section 604, emergency power systems must be installed, in accordance with the applicable requirements of NFPA 70, NFPA 110 and NFPA 111.

**Recommendation:** Required electrical systems. Where provided or required by the applicable building code, emergency power shall be maintained for electrically operated equipment and connected control circuits including but not limited to the following systems in accordance with the applicable building code:

1. HPM exhaust ventilation systems.
2. HPM gas cabinet ventilation systems.
3. HPM exhausted enclosure ventilation systems.
4. HPM gas room ventilation systems.
5. HPM gas detection systems.
6. Emergency alarm systems.
7. Manual fire alarm systems.
8. Automatic sprinkler system monitoring and alarm systems.
9. Automatic alarm and detection systems for pyrophoric liquids and Class 3 water-reactive liquids required in Section 2705.2.3.4.
10. Flow alarm switches for pyrophoric liquids and Class 3 water-reactive liquids cabinet exhaust ventilation systems required in Section 2705.2.3.4.

11. Electrically operated systems required elsewhere in this code or in the applicable building code that are applicable to the use, storage or handling of HPM.

### **CONSENSUS APPROVED**

#### **2703.15.2**

**FSB Comments:** Restores an important exception for reduced power operations. Emergency power for exhaust ventilation is required to prevent hazardous concentrations of HPM fumes or vapors in areas such as workstations or fabrication areas. Fans for exhaust ventilation draw a considerable amount of current when operating.

**Recommendation:** Exhaust ventilation systems. Exhaust ventilation systems are allowed to be maintained to operate at not less than one-half the normal fan speed on the emergency power system when it is demonstrated that the level of exhaust will maintain a safe atmosphere.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Exhaust ventilation systems. Where permitted by the applicable building code, exhaust ventilation systems are allowed to be maintained to operate at not less than one-half the normal fan speed on the emergency power system when it is demonstrated that the level of exhaust will maintain a safe atmosphere.**

#### **2703.16**

**FSB Comments:** Restores reference to NFPA 318 for maintenance requirements. This section allows the storage and use of HPM gases in subatmospheric pressure gas systems (SAGS) when the systems are installed in accordance with NFPA 318. It is the intent of this section to adopt only the provisions of NFPA 318 relating to SAGS even though the scope of the standard itself covers many more aspects of semiconductor fabrication safety.

**Recommendation:** Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be maintained in accordance with NFPA 318 and remain in accordance with the applicable building code.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Sub-atmospheric pressure gas systems. Sub-atmospheric pressure gas systems (SAGS) shall be maintained in accordance with the applicable provisions of NFPA 318 and the applicable building code.**

#### **2704.1**

**FSB Comments:** Removed unnecessary language.

**Recommendation:** General. Storage of hazardous materials shall comply with Section 2703 and this section and other applicable provisions of this code.

## CONSENSUS APPROVED

### 2704.2.1

**FSB Comments:** Restores the technical requirements and expectations for HPM storage in fabrication areas (not construction). Even though the amount of HPM in a fabrication area is controlled, it must be further controlled by storing it in approved cabinets, exhausted enclosures or a workstation. This requirement is intended to limit the exposure to occupants of the fabrication area to only the material in use in that area.

**Recommendation:** Location of HPM storage in fabrication areas.

Storage of HPM in fabrication areas shall be maintained within approved or listed storage cabinets, gas cabinets, exhausted enclosures or within a workstation as follows.

1. Flammable and combustible liquid storage cabinets shall comply with Section 5704.3.2.
2. Hazardous materials storage cabinets shall comply with Chapter 50.
3. Gas cabinets shall comply with Chapter 50. Gas cabinets for highly toxic or toxic gases shall also comply with Chapter 60.
4. Exhausted enclosures shall comply with Chapter 50. Exhausted enclosures for highly toxic or toxic gases shall also comply with Chapter 60.
5. Workstations shall comply with Section 2705.2.3.

## CONSENSUS APPROVED

### 2704.2.2.1

**FSB Comments:** Restores critical MAQ thresholds and directs locations beyond that threshold to have the arrangement approved by the Building Official.

**Recommendation:** Storage and use in fabrication areas. The maximum quantities of hazardous materials stored or used in a single fabrication area shall not exceed the quantities set forth in Table 2704.2.2.1 unless otherwise approved by the applicable building code.

TABLE 2704.2.2.1

QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5a

## CONSENSUS APPROVED WITH AMENDMENTS:

- **Storage and use in fabrication areas. The maximum quantities of hazardous materials stored or used in a single fabrication area shall not exceed the quantities approved by the applicable building code.**

**SFPC FIRE CODE EDIT WORKGROUP MEETING**  
**VHDA at DPOR**  
**9960 Mayland Drive, Henrico VA23220**  
**August 14, 2019**  
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**FIRE CODE EDIT WORKGROUP  
NOVEMBER 12, 2019  
TWIN HICKORY LIBRARY**

**2306.2.6**

**FSB Comments:** The safe operation within special enclosures is dependent upon maintaining the items listed in this section. There are no maintenance requirements in the building code. Also, language from the commentary as to the concept/definition of special enclosures has been provided for clarity.

**Recommendation:** Special enclosures. Special enclosures (essentially concrete vaults) shall be maintained and remain in accordance with the applicable building code. Tanks for liquid motor fuels are allowed to be operated in approved special enclosures where maintained in accordance with the following:

1. The special enclosure shall be maintained liquid tight and vapor tight.
2. The special enclosure shall not contain backfill.
3. Sides, top and bottom of the special enclosure shall be maintained as reinforced concrete, with openings for inspection through the top only.
4. Tank connections shall be maintained as piped or closed such that neither vapors nor liquid can escape into the enclosed space between the special enclosure and any tanks inside the special enclosure.
5. Means shall be maintained whereby portable equipment can be employed to discharge to the outside any vapors which might accumulate inside the special enclosure should leakage occur.
6. Tanks containing Class I, II or IIIA liquids operated inside a special enclosure shall maintain not more than 6,000 gallons (22 710 L) in individual capacity or 18,000 gallons (68 130 L) in aggregate capacity unless otherwise approved by the applicable building code.
7. Unless otherwise approved, each tank within special enclosures shall maintain a clear space of not less than 3 feet (910 mm) to allow for maintenance and inspection.

**CONSENSUS APPROVED**

**2311.8.4 (NEW)**

**FSB Comments:** None

**Recommendation:**

Motor vehicle repair booths

The maintenance and operation of motor vehicle repair booths shall be in accordance with Sections 2311.8.4.1 through 2311.8.4.4.

**CONSENSUS APPROVED**

**3105.6.2**

**FSB Comments:** No content change other than "temporary stage canopy" to "temporary special event structure".

**Recommendation:**

Inspection report. The inspecting agency or individual shall furnish an inspection report to the building official and fire code official. The inspection report shall indicate that the temporary special event structure was inspected and was or was not installed in accordance with the approved construction documents. Discrepancies shall be brought to the immediate attention of the installer for correction. Where any discrepancy is not corrected, it shall be brought to the attention of the building official and fire code official and the designated responsible party.

Mr. Witt questioned why it wasn't being regulated by building code

Need to determine if the last part of that definition applies to the whole section

**TABLED**

- **DHCD Staff will create a proposal to correlate this section to the IFC/ USBC**
- **Definition for “Temporary special event structure” needs consideration also**

**3206.9.1.1**

This section as written in the 2015 VSFPC is repetitive and not needed.

**DELETE**

**3206.9.1.2**

This section as written in the 2015 VSFPC is not needed. Proper maintenance of storage areas and locations is critical to ensuring that the facility continues to operate within the approved storage plan. This is not construction.

**DELETE**

**3207.2**

This section as written in the 2015 VSFPC is repetitive and not needed.

**DELETE**

**3208.2.2.1**

This section as written in the 2015 VSFPC is not needed.

**DELETE**

**3208.5.1**

There are no maintenance requirements in the building code. In addition, there is no need to have an additional reference for maintaining the sprinkler system provided. This requirement is covered in Chapter 9 for all types of sprinkler systems.

**DELETE**

### **3209.2**

There are no maintenance requirements in the building code. In addition, there is no need to have an additional reference for maintaining the sprinkler system provided. This requirement is covered in Chapter 9 for all types of sprinkler systems.

**DELETE**

### **2704.2.2.1**

**FSB Comments:** Restores critical MAQ thresholds and directs locations beyond that threshold to have the arrangement approved by the Building Official.

**Recommendation:** Storage and use in fabrication areas.

The maximum quantities of hazardous materials stored or used in a single fabrication area shall not exceed the quantities set forth in Table 2704.2.2.1 unless otherwise approved by the applicable building code.

TABLE 2704.2.2.1

QUANTITY LIMITS FOR HAZARDOUS MATERIALS IN A SINGLE FABRICATION AREA IN GROUP H-5a

**CONSENSUS APPROVED**

### **2704.3.1**

**FSB Comments:** Indicates that quantities above the thresholds listed, must be approved by the building official and comply with the applicable building code.

**Recommendation:** HPM storage. The indoor storage of HPM in quantities greater than those listed in Sections 5003.1.1 and 3404.3.4 shall be approved by the Building Official and located in a room complying with the requirements of the applicable building code and this code for a liquid storage room, HPM room or gas room as appropriate for the materials stored.

Mr. Witt pointed out that there is 2 separate lines of thought. One maintaining what was approved and two referring back to the building official when you change what was approved. How would this be worded in this section?

Mr. Brown suggested to rely on the scope

- Change 3404.3.4 to 5704.3.4

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **HPM storage. The indoor storage of HPM in quantities greater than those listed in Sections 5003.1.1 and 5704.3.4 shall be approved by the Building Official and**

**located in a room complying with the requirements of the applicable building code and this code for a liquid storage room, HPM room or gas room as appropriate for the materials stored.**

### **2705.1**

**FSB Comments:** The title of this section (use and handling) makes the additional language added for the 2015 VSFPC unnecessary.

**Recommendation:** General. The use and handling of hazardous materials shall comply with this section, Section 2703 and other applicable provisions of this code. (LFL).

**WITHDRAWN- WILL GO WITH BASE DOCUMENT**

### **2705.2.3.2**

**FSB Comments:** Restores the key reference to the applicable building code for hazardous cryogenic fluids.

**Recommendation:** Protection of vessels.

Vessels containing hazardous materials located in or connected to a workstation shall be protected as follows:

1. HPM: Vessels containing HPM shall be protected from physical damage and shall not project from the workstation.
2. Hazardous cryogenic fluids, gases and liquids: Hazardous cryogenic fluid, gas and liquid vessels located within a workstation shall be maintained as protected from seismic forces in an approved manner in accordance with the applicable building code.
3. Compressed gases: Protection for compressed gas vessels shall also comply with Section 5303.5.
4. Cryogenic fluids: Protection for cryogenic fluid vessels shall also comply with Section 5503.5.

**It is not a requirement (seismic forces), if it's needed then we can add it back in.**

**WITHDRAWN - WILL GO WITH BASE DOCUMENT**

### **2705.3.2.1**

**FSB Comments:** Restores reference to the operational requirements of 5003.10. This section addresses HPM facilities that existed before the adoption and enforcement of modern building codes. It permits the transport of HPM in corridors in existing buildings under the conditions specified in these sections and the applicable building code.

**Recommendation:** Existing fabrication area transportation. When existing fabrication areas are not required by the applicable building code to utilize approved service corridors, HPM is

allowed to be transported in existing corridors when such corridors comply with Section 5003.10 of this code and the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Existing fabrication area transportation. When existing fabrication areas are not required by the applicable building code to utilize approved service corridors, HPM is allowed to be handled and transported in accordance with Section 5003.10.**

**2705.3.3**

**FSB Comments:** Restores the requirement to only use approved service corridors if the facility is subject to those requirements in accordance with the applicable building code.

**Recommendation:** Service corridors. Where service corridors are required by the applicable building code and it is necessary to transport HPM from a liquid storage room, HPM room, gas room or from the outside of a building to the perimeter wall of a fabrication area, such transport shall be through approved service corridors.

**CONSENSUS APPROVED**

**5001.3.3.9**

**FSB Comments:** Section 5001.3.3 provides performance based alternatives, not standard maintenance or prescriptive code requirements. Therefore, reference to maintaining in accordance with the building code would not be appropriate.

**Recommendation:** Reliable power source. Where a power supply is relied upon to prevent or control an emergency condition that could endanger people or property, the power supply shall be from a reliable source.

**CONSENSUS APPROVED**

- **Edit to add 5001.3.3 “where approved in accordance with the applicable building code”**

**5001.3.3.10**

**FSB Comments:** Section 5001.3.3 provides performance based alternatives, not standard maintenance or prescriptive code requirements. Therefore, reference to maintaining in accordance with the building code would not be appropriate.

**Recommendation:** Ventilation. Where ventilation is necessary to limit the risk of creating an emergency condition resulting from normal or abnormal operations, means of ventilation shall be operated and maintained.

**CONSENSUS APPROVED**

- **Edit to add 5001.3.3 “where approved in accordance with the applicable building code”**

### **5003.1.3**

**FSB Comments:** Simply indicates that storage of hazardous materials in quantities less than the MAQ are subject to the maintenance and operation requirements of sections 5001 and 5003.

**Recommendation:** Quantities not exceeding the maximum allowable quantity per control area. The storage, use and handling of hazardous materials in quantities not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with Sections 5001 and 5003.

**Tabled**

### **5003.1.4**

**FSB Comments:** Uses the MAQ threshold to send excessive storage of hazardous materials back to the building official for review. It no longer mandates additional design or construction requirements.

**Recommendation:** Quantities exceeding the maximum allowable quantity per control area. The storage and use of hazardous materials in quantities exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be in accordance with this chapter.

Mr. Milliken suggested to come back with a package deal that flows with everything. Working on a table (explains how to use Chapter 50) to help guide the inspectors and gives fire code a reference point

Mr. Witt would rather see it as a whole

**TABLED**

### **5003.2**

**FSB Comments:** No need to change this section as it simply references the subsections below.

**Recommendation:** Systems, equipment and processes. Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall be in accordance with Sections 5003.2.1 through 5003.2.8

**CONSENSUS APPROVED WITH AMENDMENT:**

- **Systems, equipment and processes. Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall be in accordance with Sections 5003.2.1 through 5003.2.9**

### **5003.2.1**

**FSB Comments:** Uses the consensus based maintenance language at the end for tanks.

**Recommendation:** Design and construction of containers, cylinders and tanks. Portable containers and cylinders shall be designed and constructed in accordance with approved standards. Containers, cylinders, and other means used for containment of hazardous materials shall be of an approved type. Pressure vessels not meeting U.S. Department of Transportation requirements for transportation shall comply with the ASME Boiler and Pressure Vessel Code. Tanks shall be maintained as approved in accordance with the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Design and construction of containers, cylinders and tanks. Portable containers and cylinders shall be designed and constructed in accordance with approved standards. Containers, cylinders, and other means used for containment of hazardous materials shall be of an approved type. Pressure vessels not meeting U.S. Department of Transportation requirements for transportation shall comply with the ASME Boiler and Pressure Vessel Code. Tanks shall be installed in accordance with the applicable building code and shall be maintained.**

### **5003.2.2**

**FSB Comments:** Restores reference to ASME B31 as an option for maintenance. Piping, tubing, valves and fittings must be maintained to meet the requirements listed in Chapters 50 through 67, and the referenced standard or other approved standards acceptable to the fire code official. ASME B31 is the primary code for pressure piping. It is divided into nine sections, each regulating a different type of piping, and it has detailed requirements for maintenance, inspection and testing.

**Recommendation:** Piping, tubing, valves and fittings. Piping, tubing, valves, and fittings conveying hazardous materials shall be maintained in accordance with ASMEB31 or other approved standards in accordance with the applicable building code.

#### **CONSENSUS APPROVED**

### **5003.2.2.2**

**FSB Comments:** There is no need for the 2015 VSFPC language. Like the preceding section, this information is construction related and should be deleted.

**Recommendation:** Additional regulations for supply piping for health-hazard materials. (delete)

#### **CONSENSUS APPROVED to DELETE**

### **5003.2.3**

**FSB Comments:** The removal of "detection and alarm systems" removes part of the application of this section and is not a construction requirement. There is no need to remove that language. Equipment associated with the use or storage of hazardous materials must be listed or approved by a third-party testing agency.

**Recommendation:** Equipment, machinery and alarms. Equipment, machinery and detection and alarm systems associated with the use, storage or handling of hazardous materials shall be listed or approved.

## **CONSENSUS APPROVED**

### **5003.2.4.1**

**FSB Comments:** Removed construction language and kept the exception for underground vault arrangements. Current language does not even mention the term secondary containment. Secondary containment provides an additional measure of confining hazardous materials at their point of generation in case of a tank failure. As an alternative to providing secondary containment, an above-ground tank installed in an underground vault for flammable or combustible liquids in accordance with Section 5704.2.8 is allowed as being equivalent. Note that the requirement for secondary containment is a general requirement subject to the limitations and exclusions of Section 5001.1.

**Recommendation:** Underground tanks. Underground tanks used for the storage of liquid hazardous materials shall maintain secondary containment. In lieu of secondary containment for an underground tank, an above-ground tank in an underground vault complying with the applicable building code and Section 5704.2.8 shall be permitted.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Underground tanks. Where provided or required by the applicable building code, secondary containment for underground tanks shall be maintained. In lieu of secondary containment for an underground tank, an above-ground tank in an underground vault complying with the applicable building code and Section 5704.2.8 shall be permitted.**

### **5003.2.4.2**

**FSB Comments:** Restored the exception to above-ground tanks in vaults. Requirements for above-ground tanks depend on the hazards associated with the material being stored. Tank requirements can be found in Sections 2306, 5404 and 5704.2. The exception reminds that the use of an above-ground tank in a below-grade tank vault in lieu of an underground tank is permitted. A tank in a vault is regarded as equivalent in safety to an underground tank by Chapter 57, and it is a superior method with regard to environmental safety. Requirements for location on site and similar provisions should be regarded as an underground installation.

**Recommendation:** Above-ground tanks. Above-ground stationary tanks used for the storage of hazardous materials shall be maintained in accordance with the requirements for outdoor storage of the particular material involved.

Exception: Above-ground tanks that are installed in vaults complying with the applicable building code and maintained in accordance with Section 5303.16 or 5704.2.8 shall not be required to comply with location and protection requirements for outdoor storage.1. Mechanical exhaust ventilation systems that are interlocked with a gas detection system designed in accordance with Sections 2311.8.9 through 2311.8.9.2.

## **CONSENSUS APPROVED**

### **5003.2.7**

**FSB Comments:** Change construction language to maintenance language. Overfilling of tanks has been a problem over the years. This section requires atmospheric tanks with a capacity greater than 500 gallons (1893 L) containing hazardous materials to maintain an approved method of fill control.

**Recommendation:** Liquid-level limit control. Atmospheric tanks having a capacity greater than 500 gallons (1893 L) and which contain hazardous material liquids shall maintain a liquid-level limit control or other approved means to prevent overfilling of the tank in accordance with the applicable building code.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Liquid-level limit control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent overfilling of atmospheric tanks having a capacity greater than 500 gallons (1893 L) and which contain hazardous material liquids shall be maintained.**

### **5003.8**

**FSB Comments:** Scoping language for the following subsections, this item is editorial not construction.

**Recommendation:** Construction requirements.

Buildings, control areas, enclosures and cabinets for hazardous materials shall be in accordance with Sections 5003.8.1 through 5003.8.6.3.

## **CONSENSUS APPROVED**

### **5003.8.2**

**FSB Comments:** Removes construction language, provides pointer to the applicable building code and retains that hazardous threshold where the building official should review the arrangement. The manufacture and storage of hazardous materials are frequently integrated into

a single building. Additionally, it is not unusual for certain manufacturing buildings to contain multiple Group H uses where the threshold quantities are exceeded. Limiting the uses of identified hazardous materials to separate buildings containing only Group H uses maintains the intent of the code, which is to isolate large quantities of certain physical hazardous materials from uses other than those in Group H.

**Recommendation:** Detached buildings. Group H occupancies containing quantities of hazardous materials in excess of those set forth in Table 5003.8.2 shall be approved by the building official and located in accordance with the applicable building code.

Andrew stated that this table was constructed in 1996 and we need to bring it back with the other tables

Rick recommended to look at the holistic approach like the other one (5003.1.4)

**TABLED**

**TABLE 5003.8.2-DETACHED BUILDING EVALUATION**

**TABLED**

**5003.8.3**

**FSB Comments:** Restores original language for editorial purposes and the exception from the 2018 IFC. This section, in conjunction with the MAQ tables in Section 5003.1, utilizes a density concept for hazardous materials through the use of control areas. The intent of the control area concept is to provide an alternative method for the handling of hazardous materials without usually classifying the occupancy as Group H in accordance with the applicable building code. Typically, in order to not be considered Group H, the amount of hazardous materials within any single control area bounded by fire barriers, horizontal assemblies, fire walls or exterior walls cannot exceed the MAQ for a specific material listed in Table 5003.1.1(1) or 5003.1.1(2) and the applicable building code. A control area may be an entire building or a portion thereof. Where a building is not compartmented as required by the code for control areas, the entire building would be considered a single control area. Note that MAQs are based on the physical state, situation and hazard classification of materials and that up to the MAQ of each state of each class of material is permitted in each control area, subject to material incompatibility issues (see Section 5003.9.8).

**Recommendation:** 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 the applicable building code.

**CONSENSUS APPROVED**

**5003.8.3.1**

**FSB Comments:** Removes construction language and provides a reference to Chapter 7 for fire barrier maintenance.

**Recommendation:** Control Areas. Control areas separated from each other by fire barriers shall maintain those fire barriers in accordance with Chapter 7.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Control Areas. Fire barriers separating control areas shall be maintained in accordance with Chapter 7.**

**5003.8.3.2**

**FSB Comments:** Added reference to this chapter for maintenance requirements and evaluation by the Building Official when quantities exceed the MAQ listed. The amount of hazardous materials per control area and the number of control areas per floor are typically reduced if hazardous materials are stored or used above the first floor. Difficulty in gaining access for firefighting or other emergency response purposes and potential hazard to building occupants who must egress that area are increased above the first floor. The use of control areas on upper floors can be advantageous for multistory research and laboratory-type facilities that often have a functional need to use limited amounts of hazardous materials throughout various portions of the building. Without control areas, the MAQ for a hazardous material would be limited to an entire building area regardless of the overall size or height of the building.

**Recommendation:** Percentage of maximum allowable quantities. The percentage of maximum allowable quantities of hazardous materials per control area allowed at each floor level within a building shall be maintained in accordance with this chapter and the applicable building code. Quantities exceeding those listed in Table 5003.8.3.2 shall be approved by the Building Official in accordance with the applicable building code.

**TABLED - WAITING ON OUTCOME OF TABLE 5003.8.3.2**

**Table 5003.8.3.2**

**FSB Comments:** Changed table title for clarification.

**CONTROL AREAS BY FLOOR LEVEL**

**TABLED**

**5003.8.3.3**

**FSB Comments:** Added reference to this chapter for maintenance requirements. It is not the code's intent to require multiple control areas. As previously indicated, in a building that is entirely one control area, if the total quantity of hazardous materials does not exceed the MAQ, the building would typically not be classified as Group H in accordance with the applicable building code. Similarly, if the owner is satisfied with an occupancy classification of Group H,

multiple control areas would not be required. Therefore, control areas are characterized as an alternative means by which a building can be classified as other than Group H.

**Recommendation:**

Number. The maximum number of control areas per floor within a building shall be maintained in accordance with this chapter and the applicable building code.

**CONSENSUS APPROVED**

**5003.8.3.4**

**FSB Comments:** Added reference to this chapter and Chapter 7 for maintenance of fire resistance rated barriers.

**Recommendation:** Fire-resistance-rating requirements. The required fire-resistance rating for control areas shall be maintained in accordance with Chapter 7, this Chapter and the applicable building code.

**CONSENSUS APPROVED - DELETE**

**5003.8.3.5**

**FSB Comments:** Restored this important section that provides additional flexibility for M and S occupancies regarding MAQ limits. This section addresses an option for control areas containing certain nonflammable or noncombustible hazardous materials that are stored in mercantile and storage occupancies, including outdoor control areas. This option would allow Group H-4 materials, which present a health hazard rather than a physical hazard, as well as limited Group H-2 and H-3 materials such as oxidizers, to be stored in both retail display and stock areas of regulated mercantile occupancies and in storage-related occupancies in excess of the MAQs of Tables 5003.1.1(1) and 5003.1.1(2) without classifying the building as Group H in accordance with the applicable building code. Without this option, many mercantile and storage occupancies could be classified technically as Group H. The increased quantities of certain hazardous materials are based on the recognition that while there is limited risk in these occupancies, the packaging and storage arrangements can be controlled.

This section, in conjunction with Table 5003.11.1, establishes the maximum quantity of the indicated hazardous materials permitted within a single control area of a mercantile occupancy.

**Recommendation:** 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 shall comply with this chapter and the applicable building code. The aggregate quantity 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 and the applicable building code.

## **TABLED**

### **5003.8.4**

**FSB Comments:** Changed construction language to maintenance language. Where gas rooms are provided per Chapter 60 or where they are used in accordance with Table 5003.1.1(1), Note e to increase the maximum allowable quantity per control area (MAQ) of hazardous materials, they must continue to meet the requirements stated in the subsections that follow. Gas rooms are required by the applicable building code to be protected by automatic sprinklers, separated based on the occupancy, and have ventilation designed to operate at a negative pressure. These requirements are similar to those that apply to exhausted enclosures that allow the quantity increase. This section will bring consistency between the requirements for gas cabinets, exhausted enclosures and gas rooms with respect to application and MAQ.

**Recommendation:** Gas rooms. Where a gas room is provided it shall be maintained in accordance with the provisions of Chapter 60, this chapter, and the applicable building code.

## **CONSENSUS APPROVED**

### **5003.8.4.1**

**FSB Comments:** Changed title for clarity and restored maintenance language.

**Recommendation:** Protection. Gas rooms shall maintain fire protection systems and fire-rated separation from the remainder of the building in accordance with this code and the applicable building code.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Protection. Where provided or required by the applicable building code, fire protection systems and fire-rated separation shall be maintained.**

### **5003.8.4.2**

**FSB Comments:** Removed construction language and restored reference to Chapter 60.

**Recommendation:** Ventilation system. The ventilation system for gas rooms shall be maintained in accordance with this chapter, Chapter 60, and the applicable building code.

## **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation system. Where provided or required by the applicable building code, ventilation systems for gas rooms shall be operated and maintained. Highly toxic and toxic gases shall comply with Section 6004.2.2.6 and the applicable building code.**

### **5003.8.5**

**FSB Comments:** Restored reference to Chapter 60.

**Recommendation:** Exhausted enclosures. Where an exhausted enclosure is used to increase maximum allowable quantity per control area, the exhausted enclosure shall be maintained in accordance with this chapter, Chapter 60, and the applicable building code

#### **CONSENSUS APPROVED**

##### **5003.8.5.1**

**FSB Comments:** Removed construction language and restored the reference to non-combustible materials

**Recommendation:** Construction. Exhausted enclosures shall remain as and be maintained with noncombustible materials unless otherwise approved by the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Materials. Exhausted enclosures shall be maintained as approved by the applicable building code. Where noncombustible materials were required by the applicable building code, combustible materials are prohibited.**

##### **5003.8.5.2**

**FSB Comments:** Removed construction language and restored reference to Chapter 60.

**Recommendation:** Ventilation. The ventilation system for exhausted enclosures shall be maintained in accordance with this chapter, Chapter 60, and approved by the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation. Where provided or required by the applicable building code, the ventilation system for exhausted enclosures shall be operated and maintained. Ventilation systems used for highly toxic and toxic gases shall comply with this chapter, items 1, 2 and 3 of Section 6004.1.3, and the applicable building code.**

##### **5003.8.5.3**

**FSB Comments:** Added reference to Chapter 9 for fire protection system maintenance

**Recommendation:** Fire-extinguishing system. Fire-extinguishing systems required for exhaust enclosures shall be maintained in accordance with Chapter 9 and the applicable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Fire-extinguishing system. Where provided or required by the applicable building code, fire-extinguishing systems for exhaust enclosures shall be maintained in accordance with Chapter 9 and the applicable building code.**

### **5003.8.6.2**

**FSB Comments:** Removed construction language and restored reference to Chapter 60.

**Recommendation:** The ventilation system for gas cabinets shall be maintained in accordance with this chapter, Chapter 60, and approved by the applicable building code

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation. Where provided or required by the applicable building code, the ventilation system for gas cabinets shall be operated and maintained. Ventilation systems used for highly toxic and toxic gases shall comply with this chapter, items 1, 2 and 3 of Section 6004.1.2, and the applicable building code.**

### **5003.9.9**

**FSB Comments:** Shelf storage and construction is and operational requirement and not a building code requirement. Shelf storage is not addressed in the applicable building code but is addressed in NFPA 30. Shelves are not a component of building construction. Where hazardous chemicals are stored on shelves, the shelves must have a lip or guard at the edges. The shelving must be treated or otherwise protected to be compatible with the chemicals stored.

**Recommendation:** Shelf storage. Shelving shall be of substantial construction, comply with the requirements of this chapter and NFPA 30, and shall be braced and anchored in accordance with the seismic design requirements of the applicable Building Code. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers. Exceptions:

1. Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use.
2. Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5.

Shelf storage of hazardous materials shall be maintained in an orderly manner. Cable building code.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

**Shelf storage. Shelving shall be of substantial construction, comply with the requirements of this chapter and the applicable Building Code. Shelving shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored. Shelves shall be provided with a lip or guard when used for the storage of individual containers.**

**Exceptions:**

1. Storage in hazardous material storage cabinets or laboratory furniture specifically designed for such use.
2. Storage of hazardous materials in amounts not requiring a permit in accordance with Section 5001.5.

**Shelf storage of hazardous materials shall be maintained in an orderly manner.**

**5003.11**

**FSB Comments:** Added reference to maintaining storage in accordance with this chapter as well as the applicable building code. This section names three specific use or storage areas in which the applicable building code and MAQ limits on nonflammable solid and nonflammable or noncombustible liquid chemicals may typically be exceeded:

1. When they are being stored or displayed in a Group M occupancy.
2. When they are being stored in a single control area of a Group S occupancy.
3. When they are in an outdoor control area.

**Recommendation:** Group M storage and display and Group S storage.

The aggregate quantity of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single control area of a Group M occupancy, or an outdoor control area, or stored in a single control area of a Group S occupancy, is allowed to exceed the maximum allowable quantity per control area indicated in Section 5003.1 and the applicable building code when maintained in accordance with Sections 5003.11.1 through 5003.11.3.10.

**TABLED (this whole section)**

**5003.11.1**

**FSB Comments:** Added reference to the MAQ table for evaluation by the Building Official when storing or using excessive quantities of hazardous materials. Table 5003.11.1 lists the hazardous materials eligible for the mercantile and storage occupancy option and the corresponding MAQs depending on the extent of protection provided.

**Recommendation:** Maximum allowable quantity per control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single control area of a Group M occupancy or stored in a single control area of a Group S occupancy shall not exceed the amounts set forth in the applicable building code. Quantities exceeding those listed in Table 5003.11.1 shall be approved by the Building Official in accordance with the applicable building code.

**TABLED**

**TABLE 5003.11.1**

**FSB Comments:** Added table for reference.

**Recommendation:** MAXIMUM ALLOWABLE QUANTITY PER INDOOR AND OUTDOOR CONTROL AREA IN GROUP M AND S OCCUPANCIES—NONFLAMMABLE SOLIDS, NONFLAMMABLE AND NONCOMBUSTIBLE LIQUIDS d, e, f

**TABLED**

### **5003.11.2**

**FSB Comments:** Identical to 5003.11.1 but for outside areas.

**Recommendation:** Maximum allowable quantity per outdoor control area in Group M or S occupancies. The aggregate amount of nonflammable solid and nonflammable or noncombustible liquid hazardous materials stored and displayed within a single outdoor control area of a Group M occupancy shall not exceed the amounts set forth in the applicable building code. Quantities exceeding those listed in Table 5003.11.1 shall be approved by the Building Official in accordance with the applicable building code.

**TABLED**

### **5003.11.3**

**FSB Comments:** Storage and display methods are not regulated by the building code. This section is editorial for the following subsections.

**Recommendation:** Storage and display. Storage and display shall be in accordance with Sections 5003.11.3.1 through 5003.11.3.10.

**CONSENSUS APPROVED**

#### **5003.11.3.1**

**FSB Comments:** This is not design or construction criteria but rather a limitation to the quantity of material on display (operational requirement).

**Recommendation:** Density. Storage and display of solids shall not exceed 200 pounds per square foot (976 kg/m<sup>2</sup>) of floor area actually occupied by solid merchandise. Storage and display of liquids shall not exceed 20 gallons per square foot (0.50 L/m<sup>2</sup>) of floor area actually occupied by liquid merchandise.

Mr. Brown pointed out that this section is an exception to the MAQ table

Concerns about the storage space and historical data, it needs more thought

**TABLED**

#### **5003.11.3.2**

**FSB Comments:** The height of display/storage is an operational issue not a construction requirement. This section limits Group M display height to 6 feet (1829 mm). In storage areas of Group M occupancies and Group S occupancies, the storage height is increased to 8 feet (2438

mm) in recognition of the fact that these areas are not normally open to the public. These areas are also subject to the density requirements of Section 5003.11.3.1.

**Recommendation:** Storage and display height. Display height shall not exceed 6 feet (1829 mm) above the finished floor in display areas of Group M occupancies. Storage height shall not exceed 8 feet (2438 mm) above the finished floor in storage areas of Group M and Group S occupancies.

**TABLED**

**5003.11.3.4**

**FSB Comments:** Rack and shelf arrangements are operational requirements, not construction. The arrangement and operation of racks and shelves must be maintained to the requirements of Section 5003.9.9. See also Chapter 32 for high-piled combustible storage and rack storage over 12 feet in height

**Recommendation:** Racks and shelves. Racks and shelves used for storage or display shall be maintained in accordance with Section 5003.9.9.

**TABLED**

**5003.11.3.8**

**FSB Comments:** Display storage of hazardous materials is typically only permitted where floors are non-combustible materials.

**Recommendation:** Floors. Floors shall be maintained in accordance with section 5004.12 unless otherwise approved by the applicable building code.

**TABLED**

**5004.1**

**FSB Comments:** Restored reference to maintenance requirements of this chapter and a specific reference to Group M and Group S storage criteria. This entire section used to be the additional storage requirements for when quantities exceeded the MAQ. As proposed, any amounts exceeding the MAQ are subject to approval by the Building Official in accordance with the applicable building code. The current language applies these requirements to ALL storage of hazardous materials which is not the intent of the IFC.

**Recommendation:** Scope. Storage of hazardous materials in amounts exceeding the maximum allowable quantity per control area shall be maintained in Sections 5001, 5003 and 5004 and the applicable building code. Storage of hazardous materials in amounts not exceeding the maximum allowable quantity per control area shall be in accordance with Sections 5001 and 5003 and the applicable building code. Retail and wholesale storage and display of nonflammable solid and

nonflammable and noncombustible liquid hazardous materials in Group M occupancies and Group S storage shall be maintained in accordance with section 5003.11 and the applicable building code.

**Check table for MAQs prior to entering the proposal. See 5003.1.3 & 5003.1.4**

## **CONSENSUS APPROVED**

### **5004.2**

**FSB Comments:** Restored reference to maintenance requirements of this chapter as well as the applicable building code. This section introduces the specific requirements for spill control and secondary containment for solid and liquid hazardous materials. The exception recognizes the innovation of containment pallets and their suitability for preventing the spread of hazardous materials spills in outdoor control areas

**Recommendation:** Spill control and secondary containment for liquid and solid hazardous materials. Spill control and secondary containment for rooms, buildings or areas used for the storage of liquid or solid hazardous materials shall be maintained in accordance with this Chapter the applicable building code. Exception: Outdoor storage of containers on approved containment pallets in accordance with Section 5004.2.3.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Spill control and secondary containment for liquid and solid hazardous materials. Spill control and secondary containment for rooms, buildings or areas used for the storage of liquid or solid hazardous materials shall be maintained in accordance with Sections 5004.2.1 through 5004.2.3 and the applicable building code. Exception: Outdoor storage of containers on approved containment pallets in accordance with Section 5004.2.3.**

### **5004.2.1**

**FSB Comments:** Removed construction and design related language but restored the threshold where spill control must be maintained. The requirement for spill control in a room or area is based on two items. The first is that the storage container(s) have a capacity of more than 55 gallons (208 L). The second is that the aggregate capacity of multiple vessels be more than 1,000 gallons (3785 L). The area, once determined to require spill control, must be protected so that the containment

**Recommendation:** Spill control for hazardous material liquids. Unless otherwise required by the applicable building code, rooms, buildings or areas used for the storage of hazardous material liquids in individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L), shall maintain spill control to prevent the flow of liquids to adjoining areas in accordance with the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Spill control for hazardous material liquids. Where provided or required by the applicable building code, spill control for hazardous materials shall be maintained. For individual vessels having a capacity of more than 55 gallons (208 L), or in which the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L) spill control shall be maintained to prevent the flow of liquids to adjoining areas in accordance with the applicable building code.**

**5004.2.2**

**FSB Comments:** Restores the thresholds for when secondary containment should be reviewed to be maintained in accordance with the applicable building code.

**Recommendation:** Secondary containment for hazardous material liquids and solids.

Unless otherwise required by the applicable building code, buildings, rooms or areas used for the storage of hazardous materials liquids or solids shall maintain secondary containment in accordance with the applicable building code and this section when the capacity of an individual vessel or the aggregate capacity of multiple vessels exceeds the following:

1. Liquids: Capacity of an individual vessel exceeds 55 gallons (208 L) or the aggregate capacity of multiple vessels exceeds 1,000 gallons (3785 L); and
2. Solids: Capacity of an individual vessel exceeds 550 pounds (250 kg) or the aggregate capacity of multiple vessels exceeds 10,000 pounds (4540 kg).

**Additional information to be added in supplemental historical document**

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Secondary containment for hazardous material liquids and solids. Where provided or required by the applicable building code, secondary containment for hazardous materials shall be maintained.**

**TABLE 5004.2.2- REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL SOLIDS AND LIQUIDS STORAGE**

**TABLED - Supplemental Historical Documents**

**5004.2.2.1**

**FSB Comments:** The methods of containment and drainage for secondary containment in this section are similar to those of spill control. Maintenance of these methods is key to the proper protection of hazardous materials.

**Recommendation:** Containment and drainage methods. Facilities, equipment, and method used for containment and drainage of hazardous materials and fire protection water shall be maintained in accordance with this Chapter and the applicable building code.

## CONSENSUS APPROVED

### 5004.2.2.5

**FSB Comments:** Not construction. The surface of incandescent bulbs, halogen lamps and other light fixtures (luminaires) often exceeds the ignition temperature of common flammable and combustible liquids. Separation of light fixtures (luminaires) from the glazing will help reduce the surface temperature on the unexposed side of the glass. Glass panels must be designed, arranged and protected to ease cleaning and prevent breakage.

**Recommendation:** Glass panels. Panels for luminaires or for observation shall maintain seals to confine vapors, mists, residues, dusts and deposits to the flammable vapor area. Panels for luminaires shall be separated from the luminaire to prevent the surface temperature of the panel from exceeding 200°F (93°C).

## CONSENSUS APPROVED WITH AMENDMENT:

- **Monitoring. An approved monitoring method shall be provided to detect hazardous materials in the secondary containment system. The monitoring method is allowed to be visual inspection of the primary or secondary containment, or other approved means. Where secondary containment is subject to the intrusion of water, a monitoring method for detecting water shall be provided. Where monitoring devices are provided, they shall be maintained in accordance with the applicable building code.**

### 5004.2.2.6

**FSB Comments:** Restored reference to compliance with this chapter.

**Recommendation:** Drainage system design. Drainage systems shall be maintained in accordance with this Chapter and the applicable building code.

## CONSENSUS APPROVED

### 5004.3

**FSB Comments:** Added operations and maintenance language as well as the exception for flammable solids. Indoor storage areas and buildings must be ventilated either mechanically or naturally so that the level of vapors is maintained below the LFL or PEL. Keeping the area/building at these levels maintains a level of safety for the area. Storage areas for flammable solids that meet the requirements of Chapter 59 are exempted from this requirement.

**Recommendation:** Ventilation. Indoor storage areas and storage buildings shall maintain ventilation in accordance with the applicable building code and it shall be operated and maintained in accordance with this Chapter. Exception: Storage areas for flammable solids complying with Chapter 59.

**CONSENSUS APPROVED WITH AMENDMENT:**

- **Ventilation. Indoor storage areas and storage buildings shall maintain ventilation in accordance with the applicable building code and shall be operated and maintained in accordance with this Chapter. Storage areas for flammable solids shall comply with Chapter 59.**

**5004.5**

**FSB Comments:** Added reference to fire protection system maintenance in accordance with Chapter 9

**Recommendation:** Automatic sprinkler systems. Automatic sprinkler systems for the storage of hazardous materials shall be maintained in accordance with this Chapter, chapter 9 and the applicable building code.

**CONSENSUS APPROVED**

**5004.6**

**FSB Comments:** Added reference to explosion control system maintenance in accordance with Chapter 9.

**Recommendation:** Explosion control. Explosion control for storage rooms, areas and buildings shall be maintained in accordance with this chapter, chapter 9 and the applicable building code.

**CONSENSUS APPROVED**

**5004.7**

**FSB Comments:** Restored the list of items that may be required to have standby or emergency power and provided additional references for maintenance requirements. A backup emergency power source is considered essential for required systems monitoring and serving hazardous materials; therefore, when limit controls, detection systems or mechanical ventilation is required for a specific hazardous material, an emergency electrical system or standby power system is required to also be maintained.

**Recommendation:** Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 604, and this Chapter.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the**

**applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 1203, and this Chapter.**

#### **5004.8**

**FSB Comments:** Changed "provided" to "maintained" and restored the editorial scoping language.

**Recommendation:** Limit controls. Limit controls shall be maintained in accordance with Sections 5004.8.1 and 5004.8.2.

### **CONSENSUS APPROVED**

#### **5004.8.1**

**FSB Comments:** Changes from construction language to maintenance language. When a chemical is temperature sensitive, a temperature control system with a redundant backup is required to be maintained.

**Recommendation:** Temperature control. Where materials that must be kept at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall maintain a means to maintain the temperature within a safe range method in accordance with this Chapter and the applicable building code.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Temperature control. Where provided or required by the applicable building code, temperature control devices for materials that must be kept at temperatures other than normal ambient temperatures to prevent a hazardous reaction shall be maintained to keep the temperature within a safe range.**

#### **5004.8.2**

**FSB Comments:** Changes from construction language to maintenance language. Emergency vents must be maintained when the vapor density of a chemical could cause a boiling liquid expanding vapor explosion (BLEVE) during a fire.

**Recommendation:** Pressure control. Stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of exposure fires or internal reaction shall maintain an approved means that will relieve excessive internal pressure in accordance with the applicable building code.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Pressure control. Where provided or required by the applicable building code, pressure control devices on stationary tanks and equipment containing hazardous material liquids that can generate pressures exceeding design limits because of**

**exposure fires or internal reaction shall be maintained to relieve excessive internal pressure.**

**5004.9**

**FSB Comments:** Removed construction language and provided reference to Chapter 9 for maintenance requirements.

**Recommendation:** Emergency alarm. Where provided, an approved manual emergency alarm system shall be maintained in buildings, rooms or areas used for storage of hazardous materials in accordance with Chapter 9 and the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Emergency alarm. Where provided or required by the applicable building code, manual emergency alarm systems in rooms or areas used for storage of hazardous materials shall be maintained in accordance with Chapter 9 and the applicable building code.**

**5004.10**

**FSB Comments:** Changes from construction language to maintenance language. Where required by the applicable building code, emergency alarm systems, detection systems and automatic extinguishing systems must be supervised by an approved central, proprietary or remote station system. Where a facility has an on-site, “constantly attended location” (as defined in Chapter 2) staffed by qualified personnel who can respond to signals in a timely fashion, monitoring of audible and visual signals by such an attended location in lieu of off-site transmission to an approved supervising station may be permitted.

**Recommendation:** Supervision and monitoring. Where emergency alarm, detection and automatic fire-extinguishing systems are required by the applicable building code to be electrically supervised they shall maintain monitoring by an approved supervising station, or when approved, sound an audible and visual signal at a constantly attended on-site location.

**CONSENSUS APPROVED**

**5004.12**

**FSB Comments:** Changes from construction language to maintenance language.

**Recommendation:** Noncombustible Floors. Except for surfacing, floors of storage areas shall remain non-combustible where required by the applicable building code.

**CONSENSUS APPROVED**

**5005.1**

**FSB Comments:** Restored scoping language to clarify how this chapter and section is to be used for maintenance purposes. This entire section used to be the additional use/handling requirements for when quantities exceeded the MAQ. As proposed, any amounts exceeding the MAQ are subject to approval by the Building Official in accordance with the applicable building code. The current language applies this section to ALL hazardous materials storage which is NOT the intent of the IFC.

**Recommendation:** General. Use, dispensing and handling of hazardous materials in amounts exceeding the maximum allowable quantity per control area shall be maintained in accordance with Sections 5001, 5003 and 5005 and the applicable building code. Use, dispensing and handling of hazardous materials in amounts not exceeding the maximum allowable quantity per control area set forth in Section 5003.1 shall be maintained in accordance with Sections 5001 and 5003 and the applicable building code.

**Check MAQ table prior to entering proposal. See 5003.1.3 & 5003.1.4**

**CONSENSUS APPROVED**

#### **5005.1.2**

**FSB Comments:** Changes from construction to maintenance language.

**Recommendation:** Noncombustible floor. Except for surfacing, floors of areas where liquid or solid hazardous materials are dispensed or used in open systems shall be maintained as noncombustible, and liquid-tight where required by the applicable building code.

**CONSENSUS APPROVED**

#### **5005.1.3**

**FSB Comments:** Restores the reference to 5004.2 for maintenance requirements. If required by the applicable building code, the spill control and secondary containment must continue to meet the requirements of Section 5004.2

**Recommendation:** Spill control and secondary containment for hazardous material liquids. Where required by the applicable building code, spill control and secondary containment shall be maintained in accordance with section 5004.2 and the applicable building code.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Spill control and secondary containment for hazardous material liquids. Where provided or required by the applicable building code, spill control and secondary containment for hazardous materials shall be maintained in accordance with Section 5004.2 and the applicable building code.**

#### **5005.1.4**

**FSB Comments:** Changes "provided" to maintain and restores the editorial scoping language.

**Recommendation:** Limit controls.

Limit controls shall be maintained in accordance with Sections 5005.1.4.1 through 5005.1.4.4.

## **CONSENSUS APPROVED**

### **5005.1.4.1**

**FSB Comments:** When there is a danger of overfilling a tank, especially in open systems, liquid-level controls are required to be maintained.

**Recommendation:** High-liquid-level control. Where required by the applicable building code, open tanks in which liquid hazardous materials are used shall maintain a liquid-level limit control or other means to prevent overfilling of the tank.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **High-liquid-level control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent overfilling of open tanks shall be maintained.**

### **5005.1.4.2**

**FSB Comments:** Changes from construction to maintenance language. If the method of storage can allow for the collapse of the tank or other types of failure as a result of a low level of chemicals, low-liquid-level controls are required to be maintained.

**Recommendation:** Low-liquid-level control. Where required by the applicable building code, approved safeguards shall be maintained to prevent a low-liquid level in a tank from creating a hazardous condition, including but not limited to, overheating of a tank or its contents.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Low-liquid-level control. Where provided or required by the applicable building code, liquid-level limit controls or other approved means to prevent a low-liquid level in a tank from creating a hazardous condition, including but not limited to, overheating of a tank or its contents.**

### **5005.1.4.3**

**FSB Comments:** Changes from construction to maintenance language. Similar section in 5004.

**Recommendation:** Temperature control. Where required by the applicable building code, temperature controls shall be maintained in accordance with Section 5004.8.1.

### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Temperature control. Where provided or required by the applicable building code, temperature controls shall be maintained in accordance with Section 5004.8.1.**

#### **5005.1.4.4**

**FSB Comments:** Changes from construction to maintenance language. Similar section in 5004.greater than 10 square feet (0.93 m<sup>2</sup>) to confine spills or uncontrolled releases caused by overfilling or overflowing when parts are immersed.

**Recommendation:** Pressure control. Where pressure controls are required by the applicable building code they shall be maintained in accordance with section 5004.8.2.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Pressure control. Where provided or required by the applicable building code, pressure controls shall be maintained in accordance with section 5004.8.2.**

#### **5005.1.5**

**FSB Comments:** Changes from construction to maintenance language. Similar section in 5004.

**Recommendation:** Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 604, and this Chapter.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Standby or emergency power. Where mechanical ventilation, treatment systems, temperature control, alarm, detection or other electrically operated systems are required to have emergency or standby power systems in accordance with the applicable building code, those power systems shall be operated and maintained in accordance with NFPA 70, Section 1203, and this Chapter.**

#### **5005.1.6**

**FSB Comments:** Changes from construction to maintenance language. Similar section in 5004.

**Recommendation:** Supervision and monitoring. Where emergency alarm, detection and automatic fire-extinguishing systems are required by the applicable building code to be electrically supervised they shall maintain monitoring by an approved supervising station, or when approved, sound an audible and visual signal at a constantly attended on-site location.

#### **CONSENSUS APPROVED**

#### **5005.1.7**

**FSB Comments:** Retains IFC language and provides references to maintenance requirements. All areas with hazardous materials must be maintained as adequately lighted.

**Recommendation:** Lighting. Natural or artificial lighting provided for use, dispensing and handling of hazardous materials shall be maintained in accordance with this Chapter, Chapter 6, and the applicable building code.

**CONSENSUS APPROVED**

**5005.1.8**

**FSB Comments:** Added reference to fire protection maintenance requirements of Chapter 9.

**Recommendation:** Fire-extinguishing systems. Where Fire-extinguishing systems for rooms or areas in which hazardous materials are dispensed or used are required by the applicable building code they shall be maintained in accordance with this Chapter, Chapter 9, and the applicable building code

**CONSENSUS APPROVED**

**5005.1.9**

**FSB Comments:** Changes from construction to maintenance language and restores the exception. Exhaust ventilation meeting the requirements of Section 5004.3 must be maintained in indoor use and dispensing areas so that the level of vapors is maintained below the LFL or the PEL. Keeping the area/building at these levels provides a level of safety for the area.

**Recommendation:** Ventilation. Indoor dispensing and use areas shall be operated and maintained with exhaust ventilation in accordance with the applicable building code and Section 5004.3.

Exception: Ventilation is not required for dispensing and use of flammable solids other than finely divided particles.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation. Where provided or required by the applicable building code, exhaust ventilation for indoor dispensing and use areas shall be operated and maintained in accordance with the applicable building code and Section 5004.3.  
Exception: Ventilation is not required for dispensing and use of flammable solids other than finely divided particles.**

**5005.2.1.3**

**FSB Comments:** Changed "provided" to maintained" and restored reference to section 5004.2.1. Operational required that when dispensing hazardous materials into containers larger than 1.3

gallons (5 L) or in an open system with a capacity of 5.3 gallons (20 L), spill control must be provided.

**Recommendation:** Spill control for hazardous material liquids. Buildings, rooms, or areas where hazardous material liquids are dispensed into vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be maintained with spill control in accordance with Section 5004.2.1 and the applicable building code.

**TABLED**

#### **5005.2.1.4**

**FSB Comments:** Provides reference to secondary containment requirements only when found to be required by the applicable building code. Table 5005.2.1.4 lists conditions where secondary spill containment is typically required by the applicable building code. The containment must be maintained to the requirements of Section 5004.2.2 where the capacity of a single vessel exceeds 1.3 gallons (5 L) or multiple vessels exceed 5.3 gallons (20 L).

**Recommendation:** Secondary containment for hazardous material liquids. Where required by the applicable building code and Table 5005.2.1.4, buildings, rooms or areas where hazardous material liquids are dispensed or used in open systems shall maintain secondary containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following:

1. Individual vessel or system: greater than 1.3 gallons (5 L).
2. Multiple vessels or systems: greater than 5.3 gallons (20 L).

**TABLED**

**TABLE 5005.2.1.4-** Provides table for reference.

**REQUIRED SECONDARY CONTAINMENT—HAZARDOUS MATERIAL LIQUIDS USE**

**TABLED**

#### **5005.2.2**

**FSB Comments:** Restored editorial scoping language for the section.

**Recommendation:** Closed systems. Use of hazardous materials in closed containers or systems shall be in accordance with Sections 5005.2.2.1 through 5005.2.2.4.

**CONSENSUS APPROVED**

### **5005.2.2.1**

**FSB Comments:** Requires maintenance of ventilation where required by the applicable building code. References back to 5005.2.1.1

**Recommendation:** Ventilation. Where closed systems are designed to be opened as part of normal operations, ventilation required by the applicable building code shall be maintained in accordance with Section 5005.2.1.1.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Ventilation. Where closed systems are designed to be opened as part of normal operations, ventilation required by the applicable building code shall be operated and maintained in accordance with Section 5005.2.1.1.**

### **5005.2.2.2**

**FSB Comments:** T Restores technical provisions from the IFC where required by the applicable building code. Also restores the IFC exception. If the use or process could produce an explosion and the vessels are not rated as explosion proof, explosion control must be maintained to meet the requirements of Section 5004.6. The exception covers process vessels designed to contain potential explosions.

**Recommendation:** Explosion control.

Where required by the applicable building code, explosion control shall be maintained in accordance with Section 5004.6 where an explosive environment exists because of the hazardous materials dispensed or used, or as a result of the dispensing or use process.

Exception: Where process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions based on the most likely failure.

#### **CONSENSUS APPROVED WITH AMENDMENTS:**

- **Explosion control. Where provided or required by the applicable building code, explosion control shall be maintained in accordance with Section 5004.6 where an explosive environment exists because of the hazardous materials dispensed or used, or as a result of the dispensing or use process.**

**Exception: Where process vessels are designed to contain fully the worst-case explosion anticipated within the vessel under process conditions based on the most likely failure.**

### **5005.2.2.3**

**FSB Comments:** Restores technical provisions from the IFC where required by the applicable building code. See section 5004.2

**Recommendation:** Spill control for hazardous material liquids. Where required by the applicable building code, spill control for buildings, rooms or areas where hazardous material

liquids are used in individual vessels exceeding a 55-gallon (208 L) capacity shall be provided with spill control in accordance with Section 5004.2.

#### **TABLED - Supplemental Historical Documents**

##### **5005.2.2.4**

**FSB Comments:** Restores technical provisions from the IFC where required by the applicable building code. See section 5004.2.2

##### **Recommendation: Secondary containment for hazardous material liquids.**

**Where required by the applicable building code and Table 5005.2.1.4, buildings, rooms or areas where hazardous material liquids are used in vessels or systems shall maintain secondary containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following:**

- 1. Individual vessel or system: greater than 55 gallons (208 L).**
- 2. Multiple vessels or systems: greater than 1,000 gallons (3785 L).**

#### **TABLED - Supplemental Historical Documents**

##### **5005.3.4**

**FSB Comments:** Restored reference to section 5004.2.1. The dispensing and use areas of open systems located outdoors also require spill controls to be maintained when the individual containers being filled exceed 1.3 gallons (5 L) or the combined vessels or systems exceed 5.3 gallons (20 L).

##### **Recommendation: Spill control for hazardous material liquids in open systems.**

Outdoor areas where hazardous material liquids are dispensed in vessels exceeding a 1.3-gallon (5 L) capacity or used in open systems exceeding a 5.3-gallon (20 L) capacity shall be provided with spill control in accordance with Section 5004.2.1 and the applicable building code.

#### **TABLED - Supplemental Historical Documents**

##### **5005.3.5**

**FSB Comments:** Changed "provided" to maintained" and restored reference to section 5004.2.2. Dispensing and use areas of open systems located outdoors also require secondary spill controls to be maintained when the requirements of Table 5005.2.1.4 are met and the individual containers being filled exceed 1.3 gallons (5 L) or the combined vessels or systems exceed 5.3 gallons (208 L).

##### **Recommendation: Secondary containment for hazardous material liquids in open systems.**

Where required by the applicable building code and Table 5005.2.1.4, outdoor areas where hazardous material liquids are dispensed or used in open systems shall maintain secondary

containment in accordance with Section 5004.2.2 when the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following:

1. Individual vessel or system: greater than 1.3 gallons (5 L).
2. Multiple vessels or systems: greater than 5.3 gallons (20 L).

**TABLED - Supplemental Historical Documents**

**5005.3.6**

**FSB Comments:** Changed "provided" to maintained" and restored reference to section 5004.2.1. Outdoor closed systems with a liquid capacity of over 55 gallons (208 L) must have spill control maintained.

**Recommendation:** Spill control for hazardous material liquids in closed systems. Outdoor areas where hazardous material liquids are used in closed systems exceeding 55 gallons (208 L) shall maintain spill control in accordance with Section 5004.2.1 and the applicable building code.

**TABLED - Supplemental Historical Documents**

**5005.3.7**

**FSB Comments:** Changed "provided" to maintained" and restored reference to section 5004.2.2. Dispensing and use areas of closed systems located outdoors also require secondary spill controls to be maintained when the individual containers being filled exceed 55 gallons (208 L) or the combined vessels or systems exceed 1,000 gallons (3785 L).

**Recommendation:** Secondary containment for hazardous material liquids in closed systems. Where required, outdoor areas where hazardous material liquids are dispensed or used in closed systems shall maintain secondary containment in accordance with the applicable building code and section 5004.2.2 where the capacity of an individual vessel or system or the capacity of multiple vessels or systems exceeds the following: 1. Individual vessel or system greater than 55 gallons (208 L). 2. Multiple vessels or systems greater than 1,000 gallons (3785 L).

**TABLED - Supplemental Historical Documents**

**5005.4**

**FSB Comments:** Restored editorial scoping language for the section.

**Recommendation:** Handling. Handling of hazardous materials shall be in accordance with Sections 5005.4.1 through 5005.4.4.

**CONSENSUS APPROVED**

#### **5005.4.1**

**FSB Comments:** When the indoor and outdoor storage amounts of chemicals are above the MAQs per control area in accordance with the applicable building code, the area must be reviewed by the building official in accordance with the applicable building and be maintained to meet the requirements of Sections 5001, 5003, 5005.1 and 5005.4.

**Recommendation:** Quantities exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor and outdoor locations in amounts exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) through 5003.1.1(4) shall be reviewed by the building official in accordance with the applicable building code shall be maintained in accordance with Sections 5001, 5003, 5005.1 and 5005.4.

**TABLED**

#### **5005.4.2**

**FSB Comments:** Restores the IFC sentence about indoor handling which was deleted in the 2015 VSFPC.

**Recommendation:** Quantities not exceeding the maximum allowable quantity per control area. Handling of hazardous materials in indoor locations in amounts not exceeding the maximum allowable quantity per control area indicated in Tables 5003.1.1(1) and 5003.1.1(2) and the applicable building code shall be in accordance with Sections 5001 and 5003 and 5005.1. Handling of hazardous materials in outdoor locations in amounts not exceeding the maximum allowable quantity per control area indicated Table 5003.1.1(3) and 5003.1.1(4) and the applicable building code shall be in accordance with Sections 5001 and 5003.

**TABLED**

#### **5005.4.4**

**FSB Comments:** Restores the technical provisions of the IFC to ensure that hazardous materials are not transported in unauthorized locations. When exit access corridors or exit enclosures are used to transport hazardous materials with a ranking of 3 or 4, specific operational requirements and safety systems must be in place. This is not a construction requirement.

**Recommendation:** Dispensing, use and handling. Unless otherwise permitted by the applicable building code, hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 should not be transported through corridors, interior exit stairways or ramps or exit passageways, unless such areas maintain an emergency telephone system, a local manual alarm station or an approved alarm-initiating device throughout the transport route. Where required by the applicable building code, the signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.

**CONSENSUS APPROVED WITH AMENDMENTS:**

- **Dispensing, use and handling. Hazardous materials having a hazard ranking of 3 or 4 in accordance with NFPA 704 shall not be transported through corridors, interior exit stairways or ramps or exit passageways, unless such areas maintain an emergency telephone system, a local manual alarm station or an approved alarm-initiating device throughout the transport route in accordance with the applicable building code. Where required by the applicable building code, the signal shall be relayed to an approved central, proprietary or remote station service or constantly attended on-site location and shall also initiate a local audible alarm.**

**FIRE CODE EDIT WORKGROUP**  
**March 17, 2020**  
**Adobe Connect Remote Meeting**

**Attendees:**

Mike O'Connor	VPCMA
Elizabeth Rafferty	Williams and Mullen
Todd Strang	Spotsylvania Fire Marshal
Ernie Little	VFPA
Garrett Dyer	SFMO
Andrew Milliken	Stafford County
Jimmy Moss	VBCOA
John Catlett	Code Consultant – Booster Fuels
Shaun Pharr	VAMA
Russell Furr	Alexandria Fire
John Walser	Fairfax County Fire
Greg Long	MWAA Fire Marshal
Linda Hale	Loudoun County Fire
Cindy Davis	DHCD
Jeff Brown	DHCD
Richard Potts	DHCD
Thomas King	DHCD

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**Welcome and Introductions.**

**5701.2**

**FSB Comments:** Restores critical exemptions. This section generally acknowledges that some flammable and combustible liquids are regulated by other laws or provisions of this code.

**Consensus Approval**

**5701.3**

**FSB Comments:** Restores important references and clarifications. The specific design, construction and maintenance requirements for storage of flammable liquids is in more than one document.

**Consensus Approval**

**5703.1**

**FSB Comments:** Restores reference to Chapter 6 and NFPA 70.

**Consensus Approval**

### **5703.1.1**

**FSB Comments:** Restores the limits and exceptions for classified areas while also clarifying areas are to be classified in accordance with the applicable building code.

**TABLED – Need to remove construction language**

### **Table 5703.1.1**

**FSB Comments:** Table for the above.

**TABLED – See above**

### **5703.1.2**

**FSB Comments:** Removes installation language and provides maintenance language, also this restores and exception.

**TABLED – Need to remove construction language**

### **5703.1.3**

**FSB Comments:** This is important language from the IFC in cases not regulated by the applicable building code. There may be situations where the code does not specifically cover the hazardous location that should have Class I electrical equipment and wiring.

**Recommendation:** Removes the word “Specifically covered”

**Approved as Amended**

### **5703.2**

**FSB Comments:** Provides reference to Chapter 9 for fire protection system maintenance.

**Recommendation:** Check with DEQ for conflicts.

**Consensus Approval (see recommendation)**

### **5703.6**

**FSB Comments:** Restores editorial scoping language.

**Consensus Approval**

### **5703.6.1**

**FSB Comments:** Restores scoping language and references to other state and federal agencies.

**Consensus Approval**

### **5703.6.3**

**FSB Comments:** Modified this section to only apply to piping believed to be leaking, see 5703.6.2.3.1.

**Withdrawn**

### **5703.6.3.1**

**FSB Comments:** Restores important guidance about dangerous testing arrangements as well as expense responsibilities. The fire code official may require testing of existing piping. Existing piping is to be tested to the same criteria as new piping, except that piping containing flammable or combustible liquids is not to be pneumatically tested. The introduction of air into these pipes can create a vapor and air mixture that reaches the flammable range.

**Recommendation:** Changes the language to “the applicable building code”

**Approved as Amended**

### **5703.6.4**

**FSB Comments:** Restores maintenance sections regarding vehicle impact protection.

**Recommendation:** Changes “shall be provided” to “shall be maintained”

**Approved as Amended**

### **5703.6.5**

**FSB Comments:** Restores maintenance for corrosion protection. Deterioration of piping and components can cause leaks and spillage of flammable and combustible liquids. Using noncorrosive materials, protective coatings, galvanic protection or a combination of these methods can protect the piping and components.

**Consensus Approval**

### **5703.6.8**

**FSB Comments:** Restores piping support maintenance requirements. Pipe supports are necessary to reduce stress on the pipe from both external and internal sources.

**Recommendation:** Reworded to change from language that could be interpreted as a retrofit mandate.

**Approved as Amended**

### **5703.6.10**

**FSB Comments:** Restores maintenance language to ensure that all joints are liquid tight. Pipe joints are to be liquid tight. The code recognizes only three types of generic mechanical joints as being adequate for pipes carrying flammable and combustible liquids

**Consensus Approval**

**5704.2.5**

**FSB Comments:** The vapor from flammable and combustible liquids can cause an explosion when the vapor-air mixture is in an explosive ratio. Explosion control is required to be maintained in a facility storing certain liquids.

**Consensus Approval**

**5704.2.7**

**FSB Comments:** Added last minutes to address a missed provisions related to maintenance.

**Consensus Approval**

**5704.2.7.4**

**FSB Comments:** Restores reference to NFPA 30, exposure to external fire would heat a stationary above-ground tank to a greater volume of flammable vapor.

**TABLED for DEQ discussion**

**5704.2.7.6**

**FSB Comments:** Restores reference to NFPA 30 and a pointer for applicable building code.

**Consensus Approval**

**5704.2.8.5**

**FSB Comments:** Restores technical guidance while pointing back to the applicable building code. Anchoring of a tank prevents it from floating away.

**Consensus Approval**

**5704.2.8.9**

**FSB Comments:** Restores technical guidance as well as reference back to 5004.3.

**Consensus Approval**

**5704.2.8.11**

**FSB Comments:** Restores important operational criteria that must be maintained if required.

**Recommendation:** Check with DEQ.

**Consensus Approval – See recommendation**

**5704.2.9**

**FSB Comments:** Restores editorial scoping language for 5704.2.9 and restores important language for tanks that are in violation of the code requirements that was applicable when installed or approved.

**Consensus Approval**

**5704.2.9.1**

**FSB Comments:** For existing, noncompliant above-ground storage tanks that constitute a hazard, such as an underground tank being used above ground, straightforward guidance and a clear-cut authorization, as provided by this section, to remove the tank is needed. These situations are different from an abandoned or out-of-service tank.

**Consensus Approval**

**5704.2.9.3**

**FSB Comments:** Restores reference to NFPA 30 and applicable building code.

**Consensus Approval**

**5704.2.9.4**

**FSB Comments:** Restores reference to NFPA 30 and provides editorial scoping language.

**Consensus Approval**

**5704.2.9.5**

**FSB Comments:** None, added last minute to address a section previously deleted.

**Consensus Approval**

**5704.2.9.5.1**

**FSB Comments:** Changed language from construction to maintenance and operation.

**Consensus Approval**

**5704.2.9.5.2**

**FSB Comments:** Tanks storing Class IIIB liquids and connected to fuel-burning equipment, however, are subject to overfill protection requirements in accordance with Section 5704.2.7.5.8

due to the potential for the creation of hazardous conditions as discussed in the commentary to that section.

### **Consensus Approval**

#### **5704.2.9.7.5**

**FSB Comments:** Restores operational requirements for overfill prevention. To prevent spillage during filling, above-ground tanks must be limited to 95 percent of their capacity by an overfill protection system. Several methods are acceptable that provide design flexibility utilizing either an audible or visible alarm when the tank becomes 90-percent full, including draining the fill hose into the above-ground tank without exceeding the 95-percent capacity; an automatic shutoff at 95-percent full; or a means of reducing the fill rate to not more than 15 gallons per minute (gpm) (0.95 L/s) so that, at that reduced flow rate, the tank will not overfill for 30 minutes, after which the fill flow will stop automatically.

**Recommendation:** Check with DEQ for the firm number of flow rates (Mike O'Connor)

**Approved as Amended – See recommendation**

#### **5704.2.9.7.5.2**

**FSB Comments:** Restores operational requirements and an additional safety measure for the filling procedure.

### **Consensus Approval**

#### **5704.2.9.7.6**

**FSB Comments:** Restores operational requirements

### **Consensus Approval**

#### **5704.2.11**

**FSB Comments:** Restores editorial scoping language for the following subsections. Underground tanks are exposed to conditions not associated with above-ground tanks. Leakage of flammable and combustible liquids is harder to detect. Protection from loads being placed on top of or adjacent to the underground tank is needed to prevent damage to the underground tank. The underground tank must be protected from flooding and from floating in areas having a groundwater table that may be above the bottom of the underground tank.

### **Consensus Approval**

#### **5704.2.11.3**

**FSB Comments:** Restores operational requirement for spill container and reference to NFPA 30 for overfill protection.

## **Consensus Approval**

### **5704.2.11.4**

**FSB Comments:** Leakage from underground tanks is to be detected by either monitoring or an approved leak detection system.

## **Consensus Approval**

### **5704.2.11.4.2**

**FSB Comments:** Leakage detection systems must be maintained in accordance with NFPA 30.

## **Consensus Approval**

### **5704.3.3.5**

**FSB Comments:** Shelf storage is not regulated by the building code. Shelving for containers and portable tanks is to be adequate to support the container and portable tank under normal loads and seismic loads. Failure of shelving could cause damage to containers and portable tanks or leakage.

## **Consensus Approval**

### **5704.3.3.5.1**

**FSB Comments:** Shelf storage is not regulated by the building code.

## **Consensus Approval**

### **5704.3.3.6**

**FSB Comments:** Operational maintenance of aisle widths. Rack storage indicates that a larger quantity of flammable and combustible liquids is available for use. Requiring a minimum aisle width of 4 feet (1219 mm) between racks and a minimum main aisle width of 8 feet (2438 mm) provides room to access the flammable and combustible liquids while reducing interference with other racks or other containers and portable tanks.

**Recommendation:** Adds “unless otherwise approved” after the specific requirements for aisle width.

## **Approved as Amended**

### **5704.3.4**

**FSB Comments:** Restored editorial scoping language for the following subsections. The quantity of flammable and combustible liquids in an area is limited to reduce the potential fire hazard.

### **Consensus Approval**

#### **5704.3.4.1**

**FSB Comments:** Adjusted the language to indicate that quantities exceeding the MAQ require approval by the Building Official. Whereas Table 5003.1.1(1) lists the MAQs for occupancies other than Group M, Table 5704.3.4.1 lists the flammable and combustible liquid MAQ for Group M occupancies.

**Recommendation:** Change the specific Table reference to “applicable building code”.

### **Approved as Amended**

#### **Table 5704.3.4.1**

**FSB Comments:** Restores reference to the table for wholesale or retail sales.

### **Tabled – Supplemental Historical Document**

#### **5704.3.4.2**

**FSB Comments:** Restored key exceptions to quantity limits while maintaining that quantities above the MAQ must be approved by the Building Official.

**Recommendation:** Modified to refer to building official and as approved.

### **Approved as Amended**

#### **5704.3.4.3**

**FSB Comments:** Restored key exceptions to quantity limits.

**Recommendation:** Alter language to refer to applicable building code instead of the specific sections that a Building Official must approve under.

### **Approved as Amended**

#### **5704.3.4.4**

**FSB Comments:** Restores key provisions for quantities under the minimum to be regulated by the code.

**Recommendation:** None

## Approved as Amended

### 5704.3.5

**FSB Comments:** Restores editorial scoping language for the following subsections. The location of flammable and combustible liquids in a control area can increase the fire hazard.

## Consensus Approval

### 5704.3.5.1

**FSB Comments:** Restores the technical criteria while pointing to the Building Official for approval. The storage of Class I liquids in basements in amounts not exceeding the MAQ in Table 5003.1.1(1) (including the increases allowed by the table notes) is allowed by this section. Since storage is typically thought to be a safer condition than any use condition (no transport, no transfer, and so on. storage in a basement of amounts at least equal to what is allowed for use-open system MAQs in a basement (Section 5705.3.7.2) is allowed.

**Recommendation:** Remove reference to the table and alter to refer to as approved with the applicable building code.

## Approved as Amended

### 5704.3.7.2.2

**FSB Comments:** Pile and storage arrangements are typically not regulated by the building code so this section provided technical guidance for proper storage. Aisles in a liquid storage room are to be maintained to the same aisle criteria as for rack storage. A minimum aisle width of 4 feet (1219 mm) between piles and a minimum main aisle of 8 feet (2438 mm) is to provide clearance for personnel to access the flammable and combustible liquids without interference with other piles.

**Recommendation:** Alter the text to refer to the compliance within this section instead of blanket requiring that separation in aisles have proscriptive requirements.

## Approved as Amended

### 5704.3.7.3

**FSB Comments:** Restores reference to associated sections as well as indicating compliance with the applicable building code.

**Recommendation:** Add the phrase “Where provided or required...” to the start of the section.

## Approved as Amended

#### **5704.3.7.4**

**FSB Comments:** Restores reference to associated sections as well as indicating compliance with the applicable building code.

**Recommendation:** Add the phrase “Where provided or required...” to the start of the section.

**Approved as Amended**

#### **5704.3.7.5**

**FSB Comments:** Restores reference to associated sections as well as indicating compliance with the applicable building code.

**Consensus Approval**

#### **5704.3.7.5.1**

**FSB Comments:** None

**Consensus Approval**

#### **5704.3.8**

**FSB Comments:** Provides additional guidance regarding the arrangement of storage in liquid storage warehouses.

**Consensus Approval**

#### **5704.3.8.1**

**FSB Comments:** Provides additional guidance regarding the arrangement of storage in liquid storage warehouses.

**Recommendation:** Add the phrase “Unless otherwise approved by the applicable building code” to the beginning of the last sentence.

**Approved as Amended**

#### **5704.3.8.1.1**

**FSB Comments:** Additional guidance for storage arrangements in liquid storage warehouses.

**Consensus Approval**

#### **5704.3.8.1.2**

**FSB Comments:** Additional guidance for storage arrangements in liquid storage warehouses.

## **Consensus Approval**

### **5704.3.8.2**

**FSB Comments:** Minor changes and additional references to maintenance requirements.

## **Consensus Approval**

### **5704.3.8.3**

**FSB Comments:** Minor changes and additional references to maintenance requirements.

**Recommendation:** Adds the phrase “shall be operated and maintained in accordance with...”

## **Approved as Amended**

### **5704.3.8.4**

**FSB Comments:** Minor changes and additional references to maintenance requirements.

**Recommendation:** Restructure the sentence to begin by referencing that “Automatic sprinkler systems...” are what is being regulated.

### **5704.3.8.5**

**FSB Comments:** Restores the option for maintaining hose lines when approved by the fire code official. The requirements for hose lines stated in this section are consistent with the requirements of Chapter 9.

**Recommendation:** Adds the phrase “Where provided or required by the applicable building code...” to the beginning of the section.

## **Consensus Approval**

### **5704.4.3**

**FSB Comments:** Restores reference to maintenance requirements as well as an exception.

## **Tabled for applicability to building code fixes**

### **5704.4.7**

**FSB Comments:** Weather protection is not required for outdoor storage; however, where an overhead structure is erected, it must conform to the requirements of Section 5004.13. The code reference notes that an open structure consisting of only a noncombustible roof structure does not change the storage facility to indoor storage.

## **Tabled for applicability to building code fixes**

### **5705.3.6.2.3**

**FSB Comments:** Simply added NFPA 13 reference for clarity. This section lists four restrictions on solvent quantities in machines.

## **Tabled**

### **5705.5**

**FSB Comments:** Added NFPA 13 and 13R reference for clarity. Alcohol-based hand rubs are essential in health care occupancies for controlling the spread of unwanted infectious microorganisms.

## **Consensus Approval**

### **5705.5.1**

**FSB Comments:** They are portable devices not regulated by the building code. Though these provisions are not occupancy specific, in health care occupancies, hand-rub dispensers are often located in the patient room. But due to a variety of clinical issues, including patient population (psychiatric and pediatric patients), care delivery models (teaching hospitals with multiple residents in contact with patients) and patient room space constraints (lack of available space for mounting a dispenser away from constricted traffic flow, electric outlets and electric switches), mounting the dispenser in the patient room may not be possible or may compromise effective patient care. In these instances, dispensers mounted in the corridor best meet the clinical needs.

## **Consensus Approval**

### **5706.2.6**

**FSB Comments:** Restored references to maintenance requirements. Indoor above-ground storage tanks must be maintained to control leaks and spills to prevent the spread of liquid and vapors.

**Recommendation:** Adds the phrase “Where provided or required by the applicable building code...” to the beginning of the section.

## **Approved as Amended**

### **5706.3.3**

**FSB Comments:** Restores editorial scoping language for the following subsections. Sumps and basins may be necessary to temporarily store drilling materials that may contain petroleum products. The use of sumps and basins is regulated to control their size, service life and security.

## **Consensus Approval**

### **5706.3.3.3**

**FSB Comments:** Security is an operational issue. Security for the open storage of oil or petroleum products in sumps, basins and ditches is needed to prevent unauthorized access. Individuals may not realize the hazard presented by this open storage and accidentally introduce ignition sources.

### **Consensus Approval**

### **5706.4.2**

**FSB Comments:** Restores the technical provisions to highlight the intent of the requirement.

### **Consensus Approval**

### **5706.4.4**

**FSB Comments:** Restores guidance regarding the use of natural ventilation. The low flash point for Class I liquids requires that where Class I liquid is present, the area is to be ventilated to prevent the accumulation of a vapor-air mixture above the LFL. Ventilation can be either mechanical or natural.

### **Consensus Approval**

### **5706.4.9**

**FSB Comments:** Restored the reference to 5704.2.10. Flammable and combustible liquids that leak or spill from a tank must be controlled by dikes and drainage.

**Recommendation:** Changes “provided” to “shall be maintained”.

### **Approved as Amended**

### **5706.4.10**

**FSB Comments:** Restored the reference to Chapter 9 and the following subsections.

### **Consensus Approval**

### **5706.5.1.2**

**FSB Comments:** Restored operational placement criteria for weather protection canopies. Also restored the reference to 5705.3.7.5.1.

**Recommendation:** Trim the section down to remove the proscriptive requirements and limits the provisions to “maintained in accordance with the applicable code.”

### **5706.5.1.3**

**FSB Comments:** Restored operational placement criteria for weather protection canopies. Also restored the reference to 5705.3.7.5.1.

**Recommendation:** Removes the reference to Section 5705.3.7.5.1

**Approved as Amended**

#### **5706.5.1.5**

**FSB Comments:** Restored reference to maintenance requirements.

**Recommendation:** Removes reference to Section 5703.4.

**Approved as Amended**

#### **5706.5.1.6**

**FSB Comments:** Where flammable or combustible liquids are present, spills must be controlled to prevent the spread of liquid and vapors.

**Consensus Approval**

#### **5706.8.1**

**FSB Comments:** Restored the reference to 5704.2.7.3. A vapor-recovery system must be maintained with an independent system for venting overpressure or a vacuum. An overpressure condition can damage the vapor-recovery system, creating leaks or other damage. The leak or damage could allow the vapor from a flammable or combustible liquid to escape and generate a vapor-air mixture in the flammable range.

**Withdrawn**

#### **5803.1**

**FSB Comments:** Provides guidance as to what particular sections apply. This instruction is removed in the current version. When the amounts stored or used do not exceed the maximum allowable quantities per control area (MAQs), certain factors that must be adhered to include systems and processes, release of hazardous materials into the air, Material Safety Data Sheets (MSDS), hazard identification signs, and sources of ignition requirements.

**Recommendation:** Adds the phrase “in accordance with the applicable building code” to the middle of the section.

**Approved as Amended**

#### **5803.1.1.2**

**FSB Comments:** Restored proper reference to the MAQ for quantities used for maintenance and equipment purposes. Table 5003.1.1(1) and the applicable building code contains categories of storage, use-closed systems and use-open systems.

**Recommendation:** Remove reference to the Table.

**Approved as Amended**

**5803.1.5**

**FSB Comments:** Restores the reference to Chapter 6 and NFPA 70 for maintenance of electrical equipment.

**Consensus Approval**

**5804.1**

**FSB Comments:** Provides guidance for when quantities exceed the MAQ. The current language does not provide any guidance. Sections 5003.1 through 5003.11 give the requirements for the indoor storage of flammable gases; equipment; maintenance; markings and signs.

**Recommendation:** Inserts “shall be maintained” before “in accordance with the applicable...”

**Approved as Amended**

**5804.1.1**

**FSB Comments:** Changes construction language to maintenance language for explosion control systems.

**Consensus Approval**

**5806.2**

**FSB Comments:** Restores proper reference to potential local ordinances as noted in the IFC.

**Consensus Approval**

**5807.1.10**

**FSB Comments:** Provides reference to Chapter 6 for maintenance of electrical equipment to be consistent with other sections.

**Consensus Approval**

**5808.2**

**FSB Comments:** Restores critical guidance for where operations are to be conducted to avoid disaster. Restrictions against installation of hydrogen fuel gas rooms below grade are similar to those restricting the location of flammable and combustible liquids in basements.

### **Consensus Approval**

#### **5808.3**

**FSB Comments:** Explosion hazards are the primary concern, and placement of materials that have an ability to cause an explosion in below-grade spaces is not appropriate. Such spaces are more difficult to evacuate, create a fire and explosion hazard to the structure above and are very difficult for the fire department to access.

**Recommendation:** Adds the phrase “Unless otherwise approved by the applicable building code...” to the beginning of the section.

### **Approved as Amended**

#### **5808.4**

**FSB Comments:** Adds operation language in addition to the maintenance requirements.

### **Consensus Approval**

#### **5808.5**

**FSB Comments:** Adds operation language in addition to the maintenance requirements.

### **Consensus Approval**

#### **5808.5.1**

**FSB Comments:** Continues to delete construction requirements while restoring sections on operations.

### **Consensus Approval (Deleted)**

#### **5808.5.2**

**FSB Comments:** Continues to delete construction requirements while restoring sections on operations.

### **Consensus Approval (Deleted)**

#### **5808.5.3**

**FSB Comments:** The local alarm is intended to alert the occupants to an emerging hazardous condition in the vicinity. The monitor control equipment must also initiate operation of the

mechanical ventilation system in the event of a leak or rupture in the gaseous hydrogen system to prevent an accumulation of flammable gas.

**Recommendation:** Alters the text so that it's clear that at no time can flammable gas exceed 25% of LFL

### **Approved as Amended**

#### **5808.5.4**

**FSB Comments:** Gas detection systems must be maintained to be self-monitoring and fail-safe in that all safety systems are activated to alert any occupants that a problem exists and to prevent more hydrogen from being generated by any appliances in the room when hazardous conditions cannot be monitored.

**Recommendation:** Adds the phrase “Unless otherwise required by the applicable building code...” to the beginning of the section.

### **Approved as Amended**

#### **5808.6**

**FSB Comments:** Restores reference to Chapter 9 for maintenance of explosion control systems. The requirements of this section are intended to address the circumstance resulting from a catastrophic failure of the hydrogen fuel gas room.

### **Consensus Approval**

#### **5808.7**

**FSB Comments:** Restores reference to Chapter 6 for maintenance of standby power. The ventilation system and gas detection system are life safety systems and, therefore, must be dependable. Both safety systems must remain active in the event of a failure of the primary power supply.

**Recommendation:** Changes reference from Chapter 6 to Chapter 12.

### **Approved as Amended**

### **Closing Comments**

DHCD Staff and Mr. Milliken noted that they would need to work together prior to the next meeting to address any construction provisions still in Chapter 57 and draft any additional amendments as necessary.

**FIRE CODE EDIT WORKGROUP**  
**May 28, 2020**  
**Remote Meeting**

**Attendees:**

Mike O'Connor	VPCMA
Alicia Meadows	DEQ
Anthony Barrero	VDFP
Todd Strang	Spotsylvania Fire Marshal
Ernie Little	VFPA
Andrew Milliken	Stafford County
Jimmy Moss	VBCOA
Rick Witt	VBCOA
Sean Farrell	VBCOA
John Catlett	Code Consultant – Booster Fuels
Shaun Pharr	VAMA
Russell Furr	Alexandria Fire
Linda Hale	Loudoun County Fire
Cindy Davis	DHCD
Travis Luter	DHCD
Rajan Engh	DHCD
Paul Messplay	DHCD
Brian Hilderbrand	DHCD
Jeff Brown	DHCD
Richard Potts	DHCD
Thomas King	DHCD

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**5904.1**

**FSB Comments:** Scoping section that references the general storage requirement of Chapter 50.

**Comments:** Change reference to Table 5003.1.1(1) to applicable building code.

**Approved as Amended**

**5904.1.1**

**FSB Comments:** Restores technical guidance for storage requirements. These limits go back to 1978.

**Comments: Consensus Approval**

### **5904.1.2**

**FSB Comments:** Restores technical guidance for storage requirements, these limits go back to the 1996 BOCA codes.

**Comments:** None

**Consensus Approval**

### **5904.1.3**

**FSB Comments:** Prohibits storage of flammable solids in basements.

**Comments:** None

**Consensus Approval**

### **5906.2**

**FSB Comments:** Restores scoping and editorial language for subsequent subsections.

**Comments:** None

**Consensus Approval**

### **5906.2.1**

**FSB Comments:** Restores technical requirements for storage operations, this is a general criterion for a section that typically refers to magnesium storage.

**Comments:** None

**Consensus Approval**

### **5906.2.2**

**FSB Comments:** Restores technical requirements for storage operations. This section recognizes the increased hazard of storing magnesium in nonsprinklered buildings.

**Comments:** Add "Unless otherwise approved in accordance with the applicable building code..." to the beginning.

**Approved as Amended**

### **5906.2.3**

**FSB Comments:** Restores technical requirements for storage operations. This section recognizes the increased hazard of storing magnesium in nonsprinklered buildings.

**Comments:** Add “Unless otherwise approved in accordance with the applicable building code...” to the beginning.

**Approved as Amended**

### **5906.3.1**

**FSB Comments:** Restores technical requirements for storage operations. This establishes max quantities for single piles and associated aisle width requirements.

**Comments:** Add “Unless otherwise approved in accordance with the applicable building code...” to the beginning.

**Approved as Amended**

### **5906.4**

**FSB Comments:** This is a scoping section.

**Comments:** None

**Consensus Approval**

### **5906.4.2**

**FSB Comments:** Restores technical provisions for storage arrangements. Adds container requirement for fine magnesium scrap.

**Comments:** None

**Consensus Approval**

### **5906.4.3**

**FSB Comments:** Restores technical provisions for storage arrangements and operations for fine magnesium scrap.

**Comments:** None

**Consensus Approval**

## **5906.5**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

### **5906.5.1**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

### **5906.5.2**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

### **5906.5.3**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

#### **5906.5.3.1**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

#### **5906.5.3.2**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

#### **5906.5.3.4**

**FSB Comments:** These sections describe the requirements when using magnesium. This restores maintenance and operational requirements.

**Comments:** None.

**Consensus Approval**

#### **5906.5.5**

**FSB Comments:** Restores reference to NFPA 70 and Chapter 6 for maintenance of electrical equipment.

**Comments:** None

**Consensus Approval**

#### **5906.5.6**

**FSB Comments:** Restores technical language from the IFC and reference to NFPA 70. This requirement is intended to reduce the likelihood of a static buildup that could produce a flammable spark.

**Comments:** None

**Consensus Approval**

#### **6003.1.4.1**

**FSB Comments:** Restores the requirement for maintaining floors as liquid tight in accordance with the applicable building code.

**Comments:** Re-arrange the text to match other sections for liquid-tight flooring requirements.

**Approved as Amended**

#### **6003.1.4.2**

**FSB Comments:** Operational requirement for locating highly toxic materials in proper storage areas.

**Comments:** Adds “Unless otherwise approved” after the Section reference.

**Approved as Amended**

#### **6004.2.2.6**

**FSB Comments:** Restores item 2 with maintenance language.

**Comments:** Re-arrange item 2 to clarify for grammar.

**Approved as Amended**

#### **6004.2.2.8**

**FSB Comments:** Restores reference to Chapter 6 and NFPA 70 for maintenance and operation of emergency power.

**Comments:** Corrected chapter reference to Chapter 12, not 6.

**Approved as Amended**

#### **6004.2.2.9**

**FSB Comments:** Restores maintenance language for fire detection systems here provided.

**Comments:** Re-arrange the text for grammatical correctness.

**Approved as Amended**

#### **6103.1**

**FSB Comments:** Limits the scope to installation of portable equipment.

**Comments:** Mike O’Connor had some concerns for his businesses and wanted further time to discuss.

**Tabled**

#### **6104.1**

**FSB Comments:** Limits the scope to installation of portable equipment.

**Comments:** Mike O’Connor had some concerns for his businesses and wanted further time to discuss.

**Tabled**

### **6109.11.2**

**FSB Comments:** Restores a review by the building official for high hazard Group H occupancy requirements.

**Comments:** Mike O'Connor had some concerns for his businesses and wanted further time to discuss.

**Tabled**

### **6203.1**

**FSB Comments:** Restores the proper direction for how to use this chapter. The provisions of this section complement the requirements of Chapter 50 for general storage.

**Comments:** None

**Consensus Approval**

#### **6203.1.1**

**FSB Comments:** Restores reference sections to the scoping section.

**Comments:** None

**Consensus Approval**

#### **6203.1.1.1**

**FSB Comments:** Restores limitations for certain occupancies where organic peroxides should not be located.

**Comments:** None

**Consensus Approval**

#### **6203.1.1.3**

**FSB Comments:** Higher explosive risk associated with these occupancies require protection for increased danger to occupants.

**Comments:** None

**Consensus Approval**

#### **6203.1.1.4**

**FSB Comments:** This section allows limited use and storage of organic peroxides and details compliance sections that must be followed.

**Comments:** None

**Consensus Approval**

#### **6203.2**

**FSB Comments:** This section refers back to general storage requirements in chapter 50 and adds those requirements to the requirements for organic peroxide storage.

**Comments:** None

**Consensus Approval**

#### **6204.1.1**

**FSB Comments:** Detached structures designed and constructed for the sole purpose of organic peroxide provide the best protection for people and property from fire.

**Comments:** None

**Consensus Approval**

#### **6204.1.2 TABLE**

**FSB Comments:** This table has the separation distances listed for minimizing effects of radiant heat.

**Comments:** Change title to “Distance to exposures from outdoor storage areas” and renumber as 6204.2.1

**Approved as Amended**

#### **6204.1.2**

**FSB Comments:** These clearances are intended to reduce the hazard to nearby structures and people.

**Comments:** None

**Consensus Approval**

#### **6204.1.3**

**FSB Comments:** Liquid tight requirements for floors in this section.

**Comments:** Rephrase to match other sections for liquid-tight flooring.

**Approved as Amended**

#### **6204.1.4**

**FSB Comments:** Restores reference to Chapter 6.

**Comments:** None

**Consensus Approval**

#### **6204.1.5**

**FSB Comments:** Provides the proper reference to Chapter 9 for maintenance of smoke detection systems.

**Comments:** Deletes the “and remains in accordance with the applicable building code.”

**Approved as Amended**

#### **6204.1.6**

**FSB Comments:** This section lists the maximum allowable indoor storage quantities of organic peroxide.

**Comments:** Deleted reference to the Table in chapter 50.

**Approved as Amended**

#### **6204.1.10**

**FSB Comments:** Adds reference to Chapter 9 for indoor storage of explosives.

**Comments:** Delete “and remain in accordance with the applicable building code.”

**Approved as Amended**

#### **6204.1.11**

**FSB Comments:** Restores reference to Chapter 12.

**Comments:** Delete text after Section 1203 about “remain in compliance”.

**Approved as Amended**

### **6204.2.5**

**FSB Comments:** Restores reference to Table 5003.8.2 for outdoor storage areas.

**Comments:** Table 5003.8.2 needs to be moved to 5003.12 and renamed as “Outdoor separation”. The top row of the table needs to strike detached building and replace with “Separation”.

### **6204.2.3**

**FSB Comments:** Adds requirement for Outdoor Storage to comply with Table 6204.1.2.

**Comments:** None

**Consensus Approval**

### **6303.1**

**FSB Comments:** Restores how this chapter is supposed to be used by referring back to Chapter 50.

**Comments:** Verify this section is consistent with other scoping sections that refer back to earlier storage requirements.

**Consensus Approval**

### **6303.1.1**

**FSB Comments:** Some occupancies may have oxidizing materials on hand and these sections provide regulation for specific occupancy classifications.

**Comments:** None

**Consensus Approval**

### **6303.1.1.1**

**FSB Comments:** Provides guidance for Class 4 liquid and solid oxidizers.

**Comments:** None

**Consensus Approval**

### **6303.1.1.1.1**

**FSB Comments:** Provides requirements for Class 4 oxidizers in A, E, I or U occupancies.

**Comments:** None

**Consensus Approval**

#### **6303.1.1.2**

**FSB Comments:** Provides limits for Class 3 liquid and solid oxidizers.

**Comments:** None

**Consensus Approval**

#### **6303.1.1.3**

**FSB Comments:** Provides reference to Table 5003.1.1(1) for maximum quantities.

**Comments:** Deletes Table reference and replace with applicable building code.

**Approved as Amended**

#### **6303.1.2**

**FSB Comments:** Provides requirements for manual control points and automatic shutoff valves at each supply source and point of use for the flow of oxidizer gases.

**Comments:** Move “in accordance with the applicable building code” to after “shutoff valves”

**Approved as Amended**

#### **6303.1.3**

**FSB Comments:** Provides reference for control of ignition sources around oxidizers.

**Comments:** None

**Consensus Approval**

#### **6303.2**

**FSB Comments:** Restores reference to Table 6303.2.

**Comments:** None

**Consensus Approval**

## **6303.2 TABLE**

**FSB Comments:** Table provides operational requirements for storage arrangements.

**Comments:** Change name to “Outdoor Storage of Class 1 Oxidizer Liquids and Solids”

**Approved as Amended**

## **6304.1**

**FSB Comments:** Restores reference as to how to use this section and scoping.

**Comments:** Replace table reference with applicable building code.

**Approved as Amended**

### **6304.1.1**

**FSB Comments:** Restores reference to Chapter 9 for maintenance of explosion control systems.

**Comments:** Delete “and remain in accordance with the applicable building code.”

**Approved as Amended**

### **6304.1.2**

**FSB Comments:** Adds reference to Chapter 9.

**Comments:** Deletes “and remain in accordance with the applicable building code.”

**Approved as Amended**

### **6304.1.3**

**FSB Comments:** Restores technical reference for liquid tight floors.

**Comments:** Rephrase to match other liquid tight flooring sections.

**Approved as Amended**

### **6304.1.4**

**FSB Comments:** Restores reference to Chapter 9 for maintenance of smoke detection systems.

**Comments:** Deletes “and remain in accordance with the applicable building code.”

**Approved as Amended**

### **6304.1.5**

**FSB Comments:** Restores references to tables and technical details for storage requirements of oxidizers.

**Comments:** None

**Consensus Approval**

#### **6304.1.5(1) Table**

**FSB Comments:** Restores table as a reference.

**Comments:** Renumber as 6304.2.2(1) and add “Outdoor” to title.

**Approved as Amended**

#### **6304.1.5(2) Table**

**FSB Comments:** Restores table as a reference.

**Comments:** Renumber as 6304.2.2(2) and add “Outdoor” to title.

**Approved as Amended**

#### **6304.1.5(3) Table**

**FSB Comments:** Restores table as a reference.

**Comments:** Renumber as 6304.2.2(3) and add “Outdoor” to title.

**Approved as Amended**

### **6304.1.8**

**FSB Comments:** Restores reference to Table 5003.8.2 and Section 5003.8.2.

**Comments:** None

**WITHDRAWN**

### **6304.2.2**

**FSB Comments:** Restores reference to how this section is used.

**Comments:** None

**Consensus Approval**

### **6305.1**

**FSB Comments:** Restores reference to how this section is used and matches other scoping sections.

**Comments:** None

**Consensus Approval**

### **6306.4**

**FSB Comments:** Since the VRC does not regulate MAQ this section establishes a maximum aggregate amount in dwelling units.

**Comments:** Delete table reference in item 1 and replace with applicable building code.

**Approved as Amended**

### **6403.1**

**FSB Comments:** Restores direction as to how this chapter is used and brings in references to chapter 50 and other scoping sections.

**Comments:** None

**Consensus Approval**

#### **6403.1.1**

**FSB Comments:** Restores reference for emergency shutoff in compressed gas systems containing pyrophoric gas.

**Comments:** Rephrase to move the word maintained to the system being regulated and add “in accordance with the applicable building code.”

### **6304.2**

**FSB Comments:** This section provides guidance for quantities exceeding the MAQ table and complements chapter 50.

**Comments:** None

## **Consensus Approval**

### **6404.1**

**FSB Comments:** Restores critical reference to CGA G-13 and requirements in chapter 50.

**Comments:** Delete table reference and replace with “applicable building code.”

**Approved as Amended**

### **6404.1.1**

**FSB Comments:** Restores requirements for liquid tight floors.

**Comments:** Rephrase to match other liquid tight flooring sections.

**Approved as Amended**

### **6404.1.2**

**FSB Comments:** Provides inside storage restrictions, including pile height, container arrangement and aisle width.

**Comments:** None

**Consensus Approval**

### **6404.1.3**

**FSB Comments:** This section makes an important cross-reference to 5003.8.2.

**Comments:** Delete section reference.

**Approved as Amended**

### **6404.1.4**

**FSB Comments:** Restores critical operation requirement for isolation and barriers.

**Comments:** Replace “applicable building code” with Chapter 7.

**Approved as Amended**

### **6404.2.2**

**FSB Comments:** Adds reference to Chapter 9 for sprinkler systems.

**Comments:** Rephrase section for clarity.

**Approved as Amended**

#### **6405.2**

**FSB Comments:** Adds reference to Chapter 9 for sprinkler systems.

**Comments:** Rephrase section for clarity

**Approved as Amended**

#### **6504.1**

**FSB Comments:** Corrects erroneous section references for raw pyroxylin.

**Comments:** None

**Consensus Approval**

#### **6504.1.1**

**FSB Comments:** Provides important guidance for proper storage of excess material.

**Comments:** None

**Consensus Approval**

#### **6504.1.3**

**FSB Comments:** Provides important guidance for proper storage of excess material.

**Comments:** None

**Consensus Approval**

#### **6504.2**

**FSB Comments:** Provides reference to NFPA 13 for the correct type of fire protection system.

**Comments:** Adds the word “applicable” before NFPA 13 standard.

**Approved as Amended**

### **6603.1**

**FSB Comments:** Scoping section to provide guidance for how to use this chapter.

**Comments:** None

**Consensus Approval**

#### **6603.1.1**

**FSB Comments:** This is a scoping section that incorporates the general requirements of Chapter 50.

**Comments:** None

**Consensus Approval**

#### **6603.1.2**

**FSB Comments:** Restores editorial language for operational use and storage.

**Comments:** None

**Consensus Approval**

##### **6603.1.2.1**

**FSB Comments:** Restores specific guidelines for location of unstable materials because of their higher explosive hazard.

**Comments:** None

**Consensus Approval**

### **6604.1**

**FSB Comments:** This section regulates the indoor storage of reactive material and provides scoping references to Chapter 50 and the MAQ Table.

**Comments:** Delete reference to Table and replace with applicable building code.

**Consensus Approval**

#### **6604.1.1**

**FSB Comments:** Restores reference to 5003.8.2.

**Comments:** Replaces reference to 5003.8.2 with applicable building code.

**Approved as Amended**

#### **6604.1.2**

**FSB Comments:** Restores reference to Chapter 9 for explosion control maintenance areas.

**Comments:** Delete “and the applicable building code.”

**Approved as Amended**

#### **6703.1**

**FSB Comments:** Restores editorial references and guidance as to how this chapter is to be applied and brings in other scoping sections for storage.

**Comments:** None

**Consensus Approval**

#### **6703.2**

**FSB Comments:** Restores editorial references and guidance as to how this chapter is to be applied.

**Comments:** None

**Consensus Approval**

#### **6704.1**

**FSB Comments:** Restores editorial language describing how to use the chapter.

**Comments:** Delete reference to Table 5003.1.1(1).

**Approved as Amended**

#### **6704.1.1**

**FSB Comments:** Restores clarification and adds Section 5003.8.2 for reference.

**Comments:** Deletes reference to 5003.8.2

**Approved as Amended**

### **6704.1.2**

**FSB Comments:** Restores the term liquid tight to this section for flooring and brings in the chapter 50 reference.

**Comments:** Rephrase to match other liquid-tight flooring sections.

**Approved as Amended**

### **6704.1.3**

**FSB Comments:** Restores the critical requirement to maintain a waterproof room where required for water reactive solids.

**Comments:** None

**Consensus Approval**

### **6704.1.5**

**FSB Comments:** Restores technical details and requirements for proper operation storage.

**Comments:** None

**Consensus Approval**

### **6704.1.6**

**FSB Comments:** Restores technical details as well as reference to Chapter 9 for explosion control maintenance.

**Comments:** Delete “and the applicable building code.”

### **6704.2.5**

**FSB Comments:** Restores reference to 5004.2.2.

**Comments:** Delete “and the applicable building code.”

**Approved as Amended**

**FIRE CODE EDIT WORKGROUP**  
**June 11, 2020**  
**Adobe Connect Remote Meeting**

**Attendees:**

Mike O'Connor	VPCMA
Todd Strang	Spotsylvania Fire Marshal
Mike Armstrong	Harrisonburg Fire Marshal
Ernie Little	VFPA
Garrett Dyer	SFMO
Jay Davis	SFMO
Andrew Milliken	Stafford County
Jimmy Moss	VBCOA
John Catlett	Code Consultant – Booster Fuels
Shaun Pharr	VAMA
Sean Farrell	VBCOA
Linda Hale	Loudoun County Fire
Jim Stokely	VFSB
Travis Rickman	VDFP
Cindy Davis	DHCD
Jennifer Tolley	DHCD
Sara Foote	DHCD
Paul Messplay	DHCD
Brian Hilderbrand	DHCD
Jeff Brown	DHCD
Richard Potts	DHCD
Travis Luter	DHCD
Thomas King	DHCD

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**Welcome and Introductions.**

**2106.3**

**FSB Comments:** Andrew questioned if this new column was agreed upon by VBCOA and Mr. Potts and Mr. King confirmed that.

**Recommendation:** No issues, Mr. Farrell said he supported the items in the 2<sup>nd</sup> column.

**Consensus Approval**

**2108.2**

**FSB Comments:** None

**Consensus Approval**

### **2306.2.4.1**

**FSB Comments:** None

**Consensus Approval**

### **2306.2.4.2**

**FSB Comments:** None

**Recommendation:**

**Consensus Approval**

### **Replace 3105 in the IFC with the 2015 SFPC 3105**

**FSB Comments** This section contains existing Temporary Stage Canopies sections

**Comments:** Mr. Payne asked if we could just replace the term “Temporary stage canopies” with other outdoor event structure language. Mr. Brown said it’s called “temporary special event structures” which are not regulated by the building code. Mr. Payne asked if we could tweak that language and Mr. Brown said it would just put us back where we are now. Mr. Milliken said the 2018 IFC language is pretty cut and dry and doesn’t see why we would go with the 2015 SFPC.

Mr. Brown asked if there was agreement that we could go with changing “building official” to “fire official” for approval of temporary canopies.

Ms. Hale said she disagreed with making that change. She would prefer going with 2015 SFPC language and Mr. Farrell Concur. Mr. Milliken agrees.

**Consensus Approval**

### **5003.1.3**

**FSB Comments:** Tabled in previous meeting due to issues with MAQ tables.

**Comments:** VBCOA approves this change. Mr. Milliken said he’s onboard with the concept. He just wants to include table (3) and (4) back in the language and he’s good with it.

**Consensus Approval**

### **5003.1.4**

**FSB Comments:** Tabled in previous meeting due to issues with MAQ tables.

**Comments:** Mr. Milliken suggests a similar fix to the previous section and requests a pointer for when exceeding the MAQ to send the individual to the building official for approval. Mr. Farrell agrees. Mr. Farrell just wants the language cleaned up as there are very long sentences.

**Approved as Amended**

**5003.8.3.2**

**FSB Comments:** Suggest to remove the Table reference to the 5003.12 for Outdoor Storage per meeting notes from May 28<sup>th</sup> meeting.

**Consensus Approval**

**5003.8.3.5**

**FSB Comments:** This section needs to be fixed for reference to deleted MAQ tables.

**Consensus Approval**

**5003.11**

**FSB Comments:** Mr. Milliken requested that both 5003.8.3.5 and this section have more substantive references than just applicable building code. Mr. Farrell is onboard as long as the MAQ table is deleted.

**Recommendation:**

**Approved as Amended**

**5003.11.1**

**FSB Comments:** Mr. Milliken says this section is complicated because its purpose is to provide additional stipulations when exceeding quantities per control area. He recommends adding the word “increased” before “amounts” in the final sentence. Mr. Farrell states his reasoning for the original language but will not oppose the word change.

**Approved as Amended**

**5003.11.2**

**FSB Comments:** Mr. Milliken suggests using this language to fix the previous section and then remove the table references.

**Consensus Approval**

**5003.11.3.1**

**FSB Comments:** Mr. Milliken asks to preserve the references to storage square footage and density per pound. He agrees to the suggested language to refer to applicable building code instead of numerical limits.

**Approved as Amended**

**5003.11.3.2**

**FSB Comments:** None

**Consensus Approval**

**5003.11.3.4**

**FSB Comments:** None

**Consensus Approval**

**5003.11.3.8**

**FSB Comments:** None

**Consensus Approval**

**Table 5004.2.2**

**Remains deleted**

**5005.2.1.3**

**FSB Comments:** Mr. O'Connor asked if these restrictions would include gasoline and diesel. He asked if it conflicts with DEQ. Mr. Brown says that these would be superseded by the State Water Control Board.

**Consensus Approval**

**5005.2.1.4**

**FSB Comments:** Similar to previous section.

**Approved as Amended**

**5005.2.2.3**

**FSB Comments:** Mr. O'Connor asked if this was part of the SWCB conversation with DEQ and providing pointers or language somewhere about that. He asked Ms. Davis if she recalled the agreement in particular. Mr. Brown explained the way that's being handled by a separate proposal. Mr. Farrell explained how change of occupancy also deals with hazardous materials.

**Consensus Approval**

**5005.2.1.3**

**FSB Comments:** Multiple people recommended finding the changes in quantities and materials not regulated by the building code. There's a similar section in 5003 that we can refer to.

**Consensus Approval**

**5005.2.1.4**

**FSB Comments:** Mr. Milliken disagreed with some of VBCOA's rationale for deleting language in this and the previous section.

**Recommendation:  
Consensus Approval**

**5005.2.2.3**

**FSB Comments:** Mr. Milliken states their position on needing spill control, as it's an operational requirement. For the fire services it's a hard requirement. Mr. Farrell questioned if this was always a requirement. Mr. Payne suggested new language that's all encompassing for storage of hazardous materials not previously regulated.

**Consensus Approval**

**5005.4.1**

**FSB Comments:** None

**Consensus Approval**

**5005.4.2**

**FSB Comments:** Mr. Milliken stated there was a previous section where we already handled this language and we should copy that here.

**Recommendation:  
Approved as Amended**

**5104.2**

**FSB Comments:** Mr. Milliken requests we add back "level 2 and 3" for aerosol products and he asks that it be "limited to the quantities in the applicable building code" instead of just "maintained".

**Approved as Amended**

**Tables 5104.3.1 and 5104.3.2**

**FSB Comments:** These were deleted in previous meetings.

**Consensus Approval**

#### **5104.3.2.1**

**FSB Comments:** Mr. Milliken asked what we did with 5104.3.1, it was withdrawn from a previous meeting referring to the 2015 language.

#### **Recommendation:**

**Approved as Amended**

#### **5104.3.2.2**

**FSB Comments:** Mr Milliken asks to bring back the section which had previously been withdrawn and to amend it to reference the table only for pile storage.

#### **5104.5.1**

**FSB Comments:**

**Consensus Approval**

#### **Table 5106.4**

**FSB Comments:** Remain deleted.

**Consensus Approval**

#### **5601.8.1.1**

**FSB Comments:** These were tabled because we lacked an explosives expert. Mr. Milliken said it all ties in with Table 5605.3 which has distance requirements. He requests to bring that table back. There's agreement to bring back this table and incorporate it throughout these tabled section from Chapter 56.

#### **Recommendation:**

**Approved as Amended**

#### **5605.1**

**FSB Comments:** Mr. Little said he found no reference of Title 59.1 after 2002 and it should be deleted as it is old legislation.

**Approved as Amended**

#### **5605.3**

**FSB Comments:** They request to keep in the Table for separation. Mr. Milliken has no objection to removing reference to Table 5605.3. Mr. Farrell questioned how the fire marshal would determine that a barrier is adequate to comply with the last sentence. Mr. Moss has no issue with the language that's proposed.

## **Approved as Amended**

### **5605.4**

**FSB Comments:** Mr. Milliken requests that the terms in the title be reinserted into the regulatory language within the section. Ms. Hale points out this separation requirement extends to magazines and traversing between them. Mr. Farrell points out that the exception may not be necessary here or in 5605.5

## **Consensus Approval**

### **5605.5**

**FSB Comments:** This section is a scoping section. Mr. Milliken disagrees and says that the important distinction is that when you exceed the MAQ you need to be a Group H.

## **Consensus Approval**

### **5605.6.4**

**FSB Comments:** Mr. Milliken asked to strike some of the language but add back Table 5604.5.2(3). He also wants to add “and the applicable building code.

## **Recommendation:**

## **Approved as Amended**

### **5703.1.1**

**FSB Comments:** Mr. Milliken asked to carry over the LFL language from the original FSB proposal. Mr. Farrell agreed to keep the 25% LFL language.

## **Approved as Amended**

### **5703.1.2**

**FSB Comments:** This section is similar to the previous and the same changes are made here.

## **Approved as Amended**

### **5704.2.7.4**

**FSB Comments:** This had been tabled for discussion with DEQ and after several meetings we have come to an agreement on this.

**Consensus Approval**

**5704.2.8.11**

**FSB Comments:** Another one was tabled to discuss with DEQ and all issues are resolved.

**Consensus Approval**

**5704.2.9.7.5**

**FSB Comments:** Another one was tabled to discuss with DEQ and all issues are resolved.

**Consensus Approval**

**5704.4.3**

**FSB Comments:** Mr. Milliken wants to add back to exception for containment pallets as we have left it in other sections.

**Approved as Amended.**

**5704.4.7**

**FSB Comments:** None

**Consensus Approval**

**5705.3.6.2.3**

**FSB Comments:** None. Most of this section is going to be in the supplemental doc.

**Consensus Approval**

**6101.1**

**FSB Comments:** These sections were pulled out for a discussion on tank regulations and portable tanks with Mike O'Connor and others.

**Consensus Approval**

**6101.2**

**FSB Comments:** These sections were pulled out for a discussion on tank regulations and portable tanks with Mike O'Connor and others.

**Consensus Approval**

**6101.3**

**FSB Comments:** This section is deleted.

## **Approval to Delete**

### **6103.1**

**FSB Comments:** None.

## **Consensus Approval**

### **6104.1**

**FSB Comments:** This section now has the installation language removed.

## **Consensus Approval**

### **6109.11.2**

**FSB Comments:** This section was deleted previously and there was some discussion on changing the title. Mr. Milliken agrees that it will be difficult to add this section back. Mr. Brown adds back language specifying this section is for gas manufacturing, storage and mixing. The reference to NFPA 58 is also added back.

## **Consensus Approval**

### **Tables 5003.1.1(1) and 5003.1.1(2)**

**FSB Comments:** Table 5003.1.1(3) is added back to the proposal. Mr. Brown explains how section 5003.1.1 will be rewritten and explains the new proposal that will cover all the sections that reference these tables, instead they will reference Section 5003.1.1. Mr. Farrell and Milliken agree.

## **Consensus Approval**

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## **New items – Chapter 12, 38 and 39**

### **1201.1**

**FSB Comments:**

**Recommendation:**

**Consensus Approval**

### **1201.2**

**FSB Comments:**

**Consensus Approval**

### **1203.1**

**FSB Comments:**

**Consensus Approval**

**1203.1.2**

**FSB Comments:**

**Consensus Approval**

**1203.1.3**

**FSB Comments:** This section is basically a requirement to get emergency power sections approved.

**Consensus Approval**

**1203.1.5**

**FSB Comments:** If the two-hour duration language is removed, the text may need some word-smithing. Ms. Davis points out that she recalls legislative changes for emergency power in assisted living facilities that we need to check with. Mr. Moss agrees with the language being proposed.

**Recommendation:**

**Approved as Amended**

**1203.2.2**

**FSB Comments:** None

**Consensus Approval**

**1203.2.3**

**FSB Comments:** Mr. Milliken asks that the 24 hour duration be removed and replaced with applicable building code. Mr. Pharr says he needs some time to go back to his organization to get feedback, he has not had enough time to confer with his stakeholders on this. Mr. Milliken suggests we clarify that this is just where systems are provided.

**Approved as Amended**

**1203.2.7**

**FSB Comments:**

**Recommendation:**

**Consensus Approval**

**1203.2.8**

**FSB Comments:** The exception is deleted and some minor grammatical changes.

**Approved as Amended**

**1203.2.10**

**FSB Comments:** No comments.

**Consensus Approval**

**1203.2.13**

**FSB Comments:** Mr. Milliken asks that the applicable building code be added back and the reference to NFPA 70 be removed.

**Recommendation:**

**Consensus Approval**

**1203.4**

**FSB Comments:** This keeps IFC language

**Consensus Approval**

**1203.5**

**FSB Comments:** This keeps IFC language

**Consensus Approval**

**1204.2**

**FSB Comments:** None. Stick with suggested changed

**Approved as Amended**

**1204.2.1**

**FSB Comments:** This section will remain deleted.

**Recommendation:**

**1205.6**

**FSB Comments:** No comment. Mr. Milliken mentioned he forgot to put the title on the section.

**Consensus Approval**

**1205.8**

**FSB Comments:** No VA Amendment needed, straight 2018 IFC language.

**Consensus Approval**

**1205.9**

**FSB Comments:** Provides reference to the applicable building code for unapproved installations.

**Consensus Approval**

**1205.10**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1205.11**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1205.12**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1205.13**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1205.13.1**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1206.2**

**FSB Comments:** Removed construction language and revised to maintenance language.

**Consensus Approval**

**1206.2.7**

**FSB Comments:** Restores maintenance and technical language. Provides important directions for new technology and methods.

**Consensus Approval**

**1206.2.8.5**

**FSB Comments:** Restores operational and maintenance language for occupied work centers.

**Consensus Approval**

**1206.2.8.5.1**

**FSB Comments:** Restores operational and maintenance language for occupied work centers.

**Consensus Approval**

**1206.2.8.7**

**FSB Comments:** No VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.2.8.7.1**

**FSB Comments:** No VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.2.8.7.2**

**FSB Comments:** No VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.2.8.7.3**

**FSB Comments:** No VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

#### **1206.2.8.7.4**

**FSB Comments:** No VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

#### **1206.2.9**

**FSB Comments:** Revised language to match other sections regarding maximum allowable quantities. Clarifies that where a product is not listed, quantities must comply with the USBC.

**Consensus Approval**

#### **1206.2.10**

**FSB Comments:** This is just a scoping section.

**Consensus Approval**

#### **1206.2.10.1**

**FSB Comments:** Removes construction language and restores reference to only operating with listed equipment.

**Consensus Approval**

#### **1206.2.10.2**

**FSB Comments:** Restores reference to utilizing manufacturer's instructions for prepackaged and pre-engineered systems.

**Consensus Approval**

#### **1206.2.10.3**

**FSB Comments:** Changed "provided" to "maintained"

**Consensus Approval**

#### **1206.2.10.4**

**FSB Comments:** Revised language to ensure product compatibility based on manufacturer's specifications.

**Consensus Approval**

#### **1206.2.10.5**

**FSB Comments:** Operational requirements and guidance back to the applicable building code for unlisted equipment.

**Consensus Approval**

#### **1206.2.10.6**

**FSB Comments:** Removed construction language and revised to maintenance requirements.

**Consensus Approval**

#### **1206.2.10.7**

**FSB Comments:** Removed construction language and revised to maintenance requirements.

**Consensus Approval**

#### **1206.2.10.8**

**FSB Comments:** Removed construction language and revised to maintenance requirements.

**Consensus Approval**

#### **1206.2.11**

**FSB Comments:** Consolidated requirements from multiple subsections to be maintenance language in a single code section.

**Consensus Approval**

#### **1206.2.11.3**

**FSB Comments:** This section provides maintenance and operational requirements for features that address the hazards of the release of flammable gases such as hydrogen and potential spills.

**Consensus Approval**

#### **1206.2.11.5**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

#### **1206.2.12**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.2.12.1**

**FSB Comments:** Removed construction language and revised to maintenance and operations language.

**Consensus Approval**

**1206.2.12.3**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.2.12.4**

**FSB Comments:** Removed construction language and revised to maintenance and operations language.

**Consensus Approval**

**1206.2.12.5**

**FSB Comments:** Removed construction language and revised to maintenance and operations language.

**Consensus Approval**

**1206.2.12.6**

**FSB Comments:** Critical section regarding maintenance and operations of “other battery technologies.”

**Consensus Approval**

**1206.3**

**FSB Comments:** This is a scoping section.

**Consensus Approval**

**1206.3.2.6**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.3.3**

**FSB Comments:** Directs MAQ to applicable building code and Group H occupancy sections.

**Consensus Approval**

**1206.3.4**

**FSB Comments:** This is a scoping section.

**Consensus Approval**

**1206.3.4.1**

**FSB Comments:** Removed construction language and revised to reference the applicable building code.

**Consensus Approval**

**1206.3.4.2**

**FSB Comments:** Removed construction language and revised to reference the applicable building code.

**Consensus Approval**

**1206.3.4.3**

**FSB Comments:** Removed construction language and revised to reference to maintenance language.

**Consensus Approval**

**1206.3.4.4**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

**Consensus Approval**

**1206.3.4.5**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

## **Consensus Approval**

### **1206.3.5**

**FSB Comments:** Removes construction language and provides maintenance reference to Chapter 9.

## **Consensus Approval**

### **1206.3.5.3**

**FSB Comments:** Removes construction language and provides maintenance reference to Chapter 9.

## **Consensus Approval**

### **1206.3.5.4**

**FSB Comments:** No need for VA amendment, this is straight 2018 IFC language.

## **Consensus Approval**

### **1206.3.6**

**FSB Comments:** Changes fire code official to building code official for approval of new installations. This section is critical to the long-term safe and effective use of the capacitor energy storage system.

## **Consensus Approval**

### **3901.1**

**FSB Comments:** Changes reference from International Building Code to applicable building code.

## **Consensus Approval**

### **3901.3**

**FSB Comments:** Changes reference for permits to Section 107.2

## **Consensus Approval**

### **3903.1**

**FSB Comments:** Processing in accordance with this chapter is not clearly regulated in the VCC or IBC and needs clarity to show the Building Official that the applicable requirements of the applicable code are the relevant sections.

### **Consensus Approval**

#### **3903.4.1**

**FSB Comments:** Adds “applicable building code”.

### **Consensus Approval**

#### **3904.1**

**FSB Comments:** Adds “applicable building code” and clarifies that these processes are not referenced in the VCC or IBC and the applicable code prevails.

### **Consensus Approval**

#### **3905.1**

**FSB Comments:** Revised this section to operations and maintenance language.

### **Consensus Approval**

#### **3905.1.1**

**FSB Comments:** Removes construction language and adds the terms “remain” and “maintained”.

### **Consensus Approval**

### **Closing Comments**

DHCD Staff and Mr. Milliken noted that they would need to work together prior to the next meeting to address any construction provisions still in Chapter 57 and draft any additional amendments as necessary.

**FIRE CODE EDIT WORKGROUP**  
**July 30, 2020**  
**Adobe Connect Remote Meeting**

**Attendees:**

Todd Strang	Spotsylvania County
Mike Perdue	City of Salem
Greg Revels	Henrico County
Ernie Little	VFPA
John Walser	Fairfax County
Andrew Milliken	Stafford County
Shaun Pharr	AOBA
Sean Farrell	VBCOA
Travis Rickman	VDFP
David Sharp	Fairfax County
Rick Witt	VBCOA
Russell Furr	City of Alexandria
William Aceto	Fairfax County
Cindy Davis	DHCD
Paul Messplay	DHCD
Rajan Engh	DHCD
Brian Hilderbrand	DHCD
Jeff Brown	DHCD
Richard Potts	DHCD
Travis Luter	DHCD
Thomas King	DHCD

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**Welcome and Introductions.**

**3803.1**

**FSB Comments:** Scoping language

**Results:** Consensus Approval

**3803.1.7**

**FSB Comments:** Removes construction language.

**Results:** Consensus Approval

**3803.2.1**

**FSB Comments:** Changes reference from Table 5003.1.1(1) to applicable building code.

**Results:** Consensus Approval

**3804.1**

**FSB Comments:** Provides alternate general control area concept for laboratory suites.

**Results:** Consensus Approval

**3804.1.1**

**FSB Comments:** Removed construction language

**Results:** Consensus Approval

**3804.1.1 (TABLE)**

**FSB Comments:** Remove construction language and delete the table reference.

**Results:** Consensus Approval

**3804.1.1.1**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3804.1.1.2**

**FSB Comments:** Revised language to reference Chapter 7.

**Results:** Consensus Approval

**3804.1.1.3**

**FSB Comments:** Delete this construction requirements.

**Results:** Consensus Approval

**3804.1.1.4**

**FSB Comments:** Removed construction related quantities.

**Results:** Consensus Approval

**3804.1.1.6**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3804.1.1.7**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3804.1.1.8**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3804.1.1.9**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3804.1.2**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3805.1**

**FSB Comments:** Scoping section

**Results:** Consensus Approval

**3805.2**

**FSB Comments:** Removed construction related maximum quantities.

**Results:** Consensus Approval

**3805.2.1**

**FSB Comments:** Changes reference to the applicable building code, the applicable NFPA 13 standard and remove quantity adjustments in the SFPC

**Results:** Consensus Approval

**3805.2.2**

**FSB Comments:** Changes reference to applicable building code, applicable NFPA 13 standard and removes quantities.

**Results:** Consensus Approval

**3805.3**

**FSB Comments:** Removed construction language.

**Results:** Consensus Approval

**3805.3.1**

**FSB Comments:** Removed construction language.

**Results:** Consensus as Amended – add “provided” to Where required.

**3805.4**

**FSB Comments:** Revised language to make it clear that increases in quantity must be approved by the building official.

**Results:** Consensus Approval

**TABLE 3805.4**

**FSB Comments:** Delete the table

**Results:** Consensus Approval

**3806.1**

**FSB Comments:** This is scoping language only.

**Results:** Consensus Approval

**3806.2**

**FSB Comments:** Change new construction reference to the defined term laboratory suites.

**Results:** Consensus Approval

**3806.2.1**

**FSB Comments:** Removed construction related MAQs

**Results:** Consensus Approval

**TABLE 3806.2.1**

**FSB Comments:** Delete this table

**Results:** Consensus Approval

### **101.2.1**

**FSB Comments:** New subsection to make clear that these regulations do not require construction.

**Results:** Consensus Approval

### **101.2.2**

**FSB Comments:** New subsection to make clear how the Fire Official should address situations where they find construction issues.

**Results:** Consensus as Modified – Striking the second sentence

### **107.2**

**FSB Comments:** Adds the required operational permit for plant extraction systems.

**Results:** Consensus Approval

### **110.1**

**FSB Comments:** Adds language to indicate compliance with the rest of this code for unsafe structures.

**Results:** Consensus Approval

### **110.4**

**FSB Comments:** Adds language “in violation of the applicable building code”.

**Results:** Non-Consensus

### **110.4.1**

**FSB Comments:** Provides a means for the Fire Official to determine a safe occupant loading when no official load is posted.

**Results:** Non-Consensus

## **202 Food Prep Vehicles**

**FSB Comments:** Adds term for mobile food prep vehicles

**Results:** Consensus Approval

## **202 Outdoor Fireplaces**

**FSB Comments:** Removes the word portable from the phrase.

**Results:** Consensus Approval

### **301.2**

**FSB Comments:** Adds section 319 to list of sections requiring permits.

**Results:** Consensus Approval

### **304.1.2**

**FSB Comments:** Restores reference to vegetation clearance requirements in the WUIC (Wildland-Urban Interface Code).

**Results:** Group agrees to pull this proposal off and add it to a separate doc of items that weren't Consensus Approval

### **304.1.3**

**FSB Comments:** Regulates the storage of materials located under a grandstand or bleacher.

**Results:** Consensus Approval

### **304.3.2**

**FSB Comments:** Restores language to the exception deleted in the 2015 SFPC

**Results:** Consensus Approval

### **304.3.3**

**FSB Comments:** Adds exception 3 which is new for the 2018 IFC.

**Results:** Consensus Approval

### **304.3.4**

**FSB Comments:** Changes applicable building code to “applicable building code and NFPA 13 standard”.

**Results:** Consensus as Modified – Delete the term “building code” for item 1

### **308.1.6**

**FSB Comments:** Corrects reference to 107.2

**Results:** Consensus Approval

### **311.6**

**FSB Comments:** Restores language to maintain any existing fire rated separations.

**Results:** Consensus as Modified – add “where provided” to item 2

### **315.4**

**FSB Comments:** Restores exceptions deleted in the 2015 SFPC

**Results:** Consensus Approval (revert to the IFC)

### **319.5.1**

**FSB Comments:** Correlate with 904.2 and 904.3.

**Results:** Consensus Approval

### **503.1.1**

**FSB Comments:** Revises exceptions to note “the applicable NFPA 13, NFPA 13R or NFPA 13D standard”.

**Results:** Consensus Approval

### **503.7**

**FSB Comments:** Restores the scope to include through section 503.7 (state amendment)

**Results:** Consensus Approval

### **601.1**

**FSB Comments:** The base document needs updating to include the new topic list from 2018 IFC

**Results:** Consensus Approval

### **601.2**

**FSB Comments:** The base document language needs to be updated to include the list from 2018 IFC

**Results:** Consensus Approval

### **603.1.1**

**FSB Comments:** Restores the term installed since this section regulates the installation of items not subject to the applicable building code.

**Results:** Consensus Approval

### **603.1.3**

**FSB Comments:** Corrects reference to 604 based on changes in the 2018 IFC.

**Results:** Consensus as Modified – change to “applicable NFPA 70 standard”.

### **603.3**

**FSB Comments:** Revises wording for consistency

**Results:** Consensus Approval

### **603.3.2**

**FSB Comments:** Revises wording for consistency.

**Results:** Consensus Approval

### **603.3.2.1**

**FSB Comments:** Restores reference to increased quantities of fuel oil that may be stored in a building. This section correlates with Table 307.1(1).

**Results:** Non-Consensus

### **603.3.2.4**

**FSB Comments:** Clarifies that a building permit is required for new or modified piping.

**Results:** Consensus Approval

### **603.3.2.6**

**FSB Comments:** Spill containment is operational and can be achieved without construction language.

**Results:** Consensus as Modified – the group modified the language based on previous spill containment language agreed upon in Chapter 57.

### **603.3.3**

**FSB Comments:** Restores reference to NFPA 31.

**Results:** Consensus as Modified – changes to “applicable NFPA 31 standard”

### **603.5**

**FSB Comments:** Restores requirement for space heating appliances to be listed.

**Results:** Consensus Approval

### **603.5.2**

**FSB Comments:** Restores reference to manufacturer’s instructions and NFPA 70.

**Results:** Consensus As Modified – change to “applicable NFPA 70 standard”

**603.6**

**FSB Comments:** Restores prohibition to obvious fire hazards from certain chimneys.

**Results:** Consensus Approval

**603.6.2**

**FSB Comments:** Restores the word “supports”

**Results:** Consensus Approval

**603.6.4**

**FSB Comments:** Restores the word “supports”

**Results:** Consensus Approval

**603.6.5**

**FSB Comments:** Restores the word “supports”

**Results:** Consensus Approval

**603.8**

**FSB Comments:** Revised sentence structure for consistency.

**Results:** Consensus Approval

**604.10.1**

**FSB Comments:** Delete state amendment.

**Results:** Consensus Approval

**605.1.2**

**FSB Comments:** Restores language about decommissioning.

**Results:** Consensus as Modified – revised to “applicable operating procedures of IIAR-7”

**605.4**

**FSB Comments:** Ensures that changes in the type of refrigerant will comply with the requirements of the building code.

**Results:** Consensus Approval

**605.6**

**FSB Comments:** Corrects reference to 605.

**Results:** Consensus Approval

**605.8.1**

**FSB Comments:** Restores model code language for explosion risk and important emergency shut downs from refrigerant systems.

**Results:** Non-Consensus

**605.9**

**FSB Comments:** Restores model code language.

**Results:** Consensus as Modified – revised to “maintained and remain accessible”

## **605.10**

**FSB Comments:** Restores model code language for automatic emergency pressure control systems.

**Results:** Consensus as Modified – Reworked to replace “installed” with “provided” and to say “shall be maintained”.

### **605.10.1**

**FSB Comments:** Imposes operational requirements, not construction language.

**Results:** Withdrawn

#### **605.10.1.1**

**FSB Comments:** Imposes operational requirements, not construction language.

**Results:** Withdrawn

#### **605.10.1.2**

**FSB Comments:** Altering language to “where provided or required” and “it shall be maintained”.

**Results:** Consensus Approval

## **605.12**

**FSB Comments:** Corrects reference to 605.

**Results:** Consensus Approval

### **605.12.2**

**FSB Comments:** Corrects reference to 605.

**Results:** Consensus Approval

### **605.12.3**

**FSB Comments:** Restores reference to approved discharge methods for toxic refrigerants.

**Results:** Consensus as Modified – adding “where required or provided” to the beginning.

### **605.12.4**

**FSB Comments:** Restores technical and operational language for discharge methods.

**Results:** Consensus as Modified – adding “where required or provided” to describe the systems.

### 605.12.5

**FSB Comments:** Restores technical and operational language for treatment systems.

**Results:** Consensus Approval

### 605.12.6

**FSB Comments:** Restores technical language for flaring operations. Destruction of refrigerant by incineration is supposed to render the discharge harmless.

**Results:** Consensus as Modified – editorial changes and adding “where required”.what

### 605.16

**FSB Comments:** Restores model code language and intent of this section.

**Results:** Consensus as Modified – delete the exceptions.

### 605.17

**FSB Comments:** Scoping language only.

**Results:** Consensus Approval

### 605.17.2

**FSB Comments:** This is operational language only.

**Results:** Consensus as Modified – alter last sentence to “Means to manually shut down the system shall be maintained”

### 605.17.3

**FSB Comments:** Operation and maintenance language only, not related to construction.

**Results:** Consensus as Modified – rephrase to “Where required by the applicable building code...”

### 606.1

**FSB Comments:** Corrects reference to 606.

**Results:** Consensus Approval

### 606.2

**FSB Comments:** Corrects reference to 1203 and 606.

**Results:** Consensus Approval

### **606.5**

**FSB Comments:** Corrects sentence structure.

**Results:** Consensus Approval

### **607.2**

**FSB Comments:** Andrew believes this change is no longer needed based on other changes and he can withdraw it.

**Results:** Withdrawn

### **705.2.2/705.2.3/705.2.4/707.1**

**FSB Comments:** The fire services want to delete the state amendment and revert to the IFC.

**Results:** Deleted, revert to IFC language.

### **803.1.1.1**

**FSB Comments:** Totally revised section to clarify product testing information.

**Results:** Consensus Approval

### **803.2**

**FSB Comments:** Changed “be” to “Remain.”

**Results:** Consensus Approval

### **803.3**

**FSB Comments:** Clarifies that interior finish shall not be changed unless approved by the building official.

**Results:** Consensus Approval

### **803.5**

**FSB Comments:** Restores language deleted from 803.5.2.

**Results:** Consensus Approval

### **803.5.1/803.5.1.1/803.5.2**

**FSB Comments:** Delete state amendments to revert to IFC language.

**Results:** Consensus Approval

### **803.6**

**FSB Comments:** Restores the format of the 2018 IFC.

**Results:** Consensus Approval

### **803.7**

**FSB Comments:** Adds statement about building official approval for new installations

**Results:** Consensus Approval

### **803.8**

**FSB Comments:** Adds statement for building official approval of new installations.

### **803.9**

**FSB Comments:** Changes reference to 803.1.1 to “applicable building code”

**Results:** Consensus Approval

### **803.10**

**FSB Comments:** Adds statement about building official approval for new installations.

**Results:** Consensus Approval

### **803.11**

**FSB Comments:** Adds statement about building official for new installations.

**Results:** Consensus Approval

### **803.13**

**FSB Comments:** Provide maintenance language for new sections.

**Results:** Consensus Approval

### **803.14**

**FSB Comments:** Changes “tested” to “subject to interior finish requirements”.

**Results:** Consensus Approval

### **803.15**

**FSB Comments:** Changes IBC to “applicable building code”

**Results:** Consensus Approval

### **804.1**

**FSB Comments:** Adds statement indicating that trim must be approved by the Building Official. Restores guidance for handrails and guards.

Mr Witt questions whether theres a definition for interior trim in the building code. Mr Milliken points out to the need to this for very large trim which could pose a fire hazard. Mr. Farrell asks where the threshold is that it becomes a risk and how far does this go back in the I-codes. Mr Brown suggests adding “combustible” to trim to make it clear.

**Results:** Consensus as Modified

### **804.2**

**FSB Comments:** Adds statement indicating that trim must be approved by the building official.

**Results:** Consensus Approval

### **804.3**

**FSB Comments:** Restores existing exemption for floor finishes.

**Results:** Consensus as Modified – “in accordance with the applicable building code”

#### **804.3.1.1**

**FSB Comments:** New section to clarify that manufacturer’s product information is the source of maintenance and use requirements.

Mr. Witt and Farrell had some back and forth about a proposed exception for non-fiber based flooring, which was ultimately stricken and reverted back to the original proposal.

**Results:** Consensus Approval

#### **804.3.2/804.3.3/804.3.3.1/804.3.3.2/804.4**

**FSB Comments:** Delete these sections.

**Results:** Consensus Approval

### **806**

**FSB Comments:** Restores exceptions as currently provided

**Results:** Consensus Approval

### **807.2**

**FSB Comments:** Corrects inaccurate reference to IBC and NFPA 13.

**Results:** Consensus Approval

**807.3**

**FSB Comments:** Revert language back to IFC 2018 language.

**Results:** Consensus Approval

**807.5.2.1**

**FSB Comments:** Correlates to the applicable NFPA standard for smoke detection equipment.

**Results:** Consensus as Modified – altered the language to fire alarm system from smoke detection.

**807.5.5.1**

**FSB Comments:** Replaces the undefined term “fire alarm” with the defined term “automatic smoke detection system”.

**Results:** Consensus as Modified

**808.1**

**FSB Comments:** Restores exception for recycling containers that comply with 808.1.2

**Results:** Consensus Approval

**808.4**

**FSB Comments:** Changes reference to 803 to approval by the building official.

**Results:** Consensus Approval

**901.4.3**

**FSB Comments:** Revised language to maintain fire resistance rated construction in accordance with Ch 7.

**Results:** Consensus Approval

**903.3**

**FSB Comments:** Clarifies that the fire sprinkler systems shall be approved by the building official.

**Results:** Consensus Approval

**903.3.7**

**FSB Comments:** Restores pointer to section 912 for Fire Department Connections.

#### **903.3.8.1**

**FSB Comments:** Clarifies that limited area systems must be maintained in accordance with NFPA 25.

**Results:** Consensus as Modified – adds the term “applicable” before the NFPA standard.

#### **903.4**

**FSB Comments:** Restores guidance as to which valves remain supervised.

Mr. Witt and Mr. Milliken had a back and forth about this section about how to approach it but ultimately they went with the VFSB recommendation.

**Results:** Consensus Approval

#### **904.3**

**FSB Comments:** Correlate with 319.4 so that they connect for mobile food prep vehicles.

**Results:** Consensus Approval

#### **904.3.1**

**FSB Comments:** Correlate with 319.4 for mobile food prep vehicles.

**Results:** Consensus Approval

#### **904.2**

**FSB Comments:** Restores reference to maintaining electrical components in accordance with the applicable building code and NFPA 70.

**Results:** Consensus Approval

#### **904.4**

**FSB Comments:** Restores signage requirements.

**Results:** Consensus Approval

#### **904.14**

**FSB Comments:** Corrects references and adds the last sentence.

**Results:** Consensus Approval

#### **905.2**

**FSB Comments:** Changes appropriate standard from NFPA 14 to 25.

**Results:** Consensus as Modified – adding “applicable” before NFPA 25.

#### **905.3.4.1**

**FSB Comments:** Restores context language for this section applying to stages.

**Results:** Consensus as Modified – moving approved to the end of the sentence.

#### **905.7**

**FSB Comments:** Remove VA amendment and restore IFC language

**Results:** Consensus Approval

#### **905.7.1**

**FSB Comments:** Remove VA amendment and restore IFC language

**Results:** Consensus Approval

#### **905.7.2**

**FSB Comments:** Remove VA amendment and restore IFC language

**Results:** Consensus Approval

#### **304.3.3**

**FSB Comments:** Adds exception 3 which is new for the 2018 IFC.

**Results:** Consensus Approval

#### **603.3**

**FSB Comments:** Removes construction language

**Results:** Consensus as Modified

#### **603.5**

**FSB Comments:** Removes construction language.

**Results:** Consensus as Modified

#### **605.1.2**

**FSB Comments:** Restores language about decommissioning systems.

**Results:** Consensus as Modified – adds “applicable operating” to provisions of IIAR-7.

### **605.16**

**FSB Comments:** Restores the purpose of this section as as a reference for classified electrical requirements.

**Results:** Consensus as Modified – deleting the exception and reorganizes the text to more clearly refer to applicable building code.

### **605.17.2**

**FSB Comments:** Changes to operational language instead of construction.

**Results:** Consensus as Modified – Change last sentence to “means to manually shut down the system shall be maintained”

### **605.17.3**

**FSB Comments:** Changes to operational language instead of construction.

**Results:** Consensus as Modified – adds “Where required” to the beginning.

### **Closing Comments**

Mr. Milliken thanked the group for their persistence and effort in getting this much accomplished. He said he would confer with the rest of the fire services community on how to address the proposals not completed during this process.