



VIRGINIA FIRE PREVENTION ASSOCIATION FALL CONFERENCE 2020

Waynesboro, VA



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Objectives

- Develop a better understanding of Virginia fire death data
- Develop a better understanding of the permissible fireworks process and consumer fireworks in Virginia
- Develop a better understanding of indoor pyrotechnics and flame effects

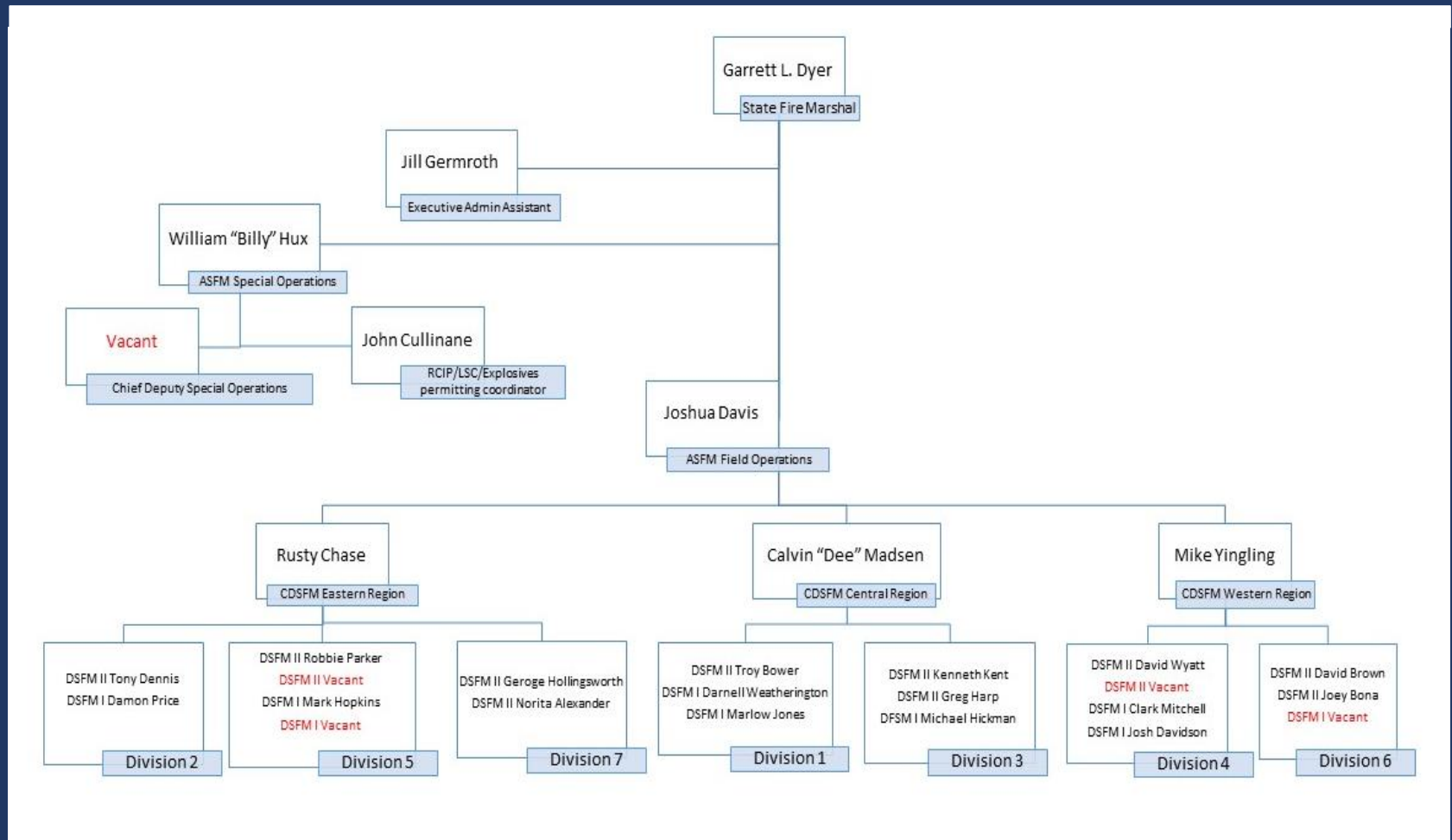


Virginia State Fire Marshals Office: Special Operations Section

- Certify Blasters/Pyrotechnicians in the Commonwealth
- Issue use permits/provide oversight for aerial fireworks/pyrotechnics
- Issue use permits/provide oversight for blasting operations
- Issue explosive storage permits/inspect explosive magazines
- Conduct criminal background checks of VDFP employees and all Blasters/Pyrotechnicians in Virginia
- Environmental Crimes
- Oversee code enforcement of food trucks/special events/college football games
- Oversee the Virginia permissible fireworks list
- Support Local Fire Marshals



Virginia State Fire Marshals Office: Org Chart



Virginia Fire Death Reporting



COMMONWEALTH OF VIRGINIA STATE FIRE MARSHAL'S OFFICE FIRE FATALITY REPORT



INCIDENT DATE:	TIME:	DAY OF WEEK:
DATE OF DEATH:		
FDID #:	VFIRS INCIDENT #:	
ADDRESS OF FIRE:		
TYPE OF PROPERTY STRUCTURE:		
STRUCTURE BUILD DATE:		
OWNER:	OCCUPANT:	
AREA OF FIRE ORIGIN:		
CAUSE OF FIRE:		
SMOKE ALARM STATUS: (One)	PRESENT/ACTIVATED <input type="checkbox"/>	PRESENT/NOT ACTIVATED <input type="checkbox"/>
	NONE <input type="checkbox"/>	UNKNOWN <input type="checkbox"/>
SMOKE ALARM TYPE: (One)	ELECTRIC WIRED <input type="checkbox"/>	9 VOLT BATTERY <input type="checkbox"/>
	10 YEAR LITHIUM BATTERY <input type="checkbox"/>	UNKNOWN <input type="checkbox"/>
SPRINKLER STATUS: (One)	PRESENT/ACTIVATED <input type="checkbox"/>	PRESENT/NOT ACTIVATED <input type="checkbox"/>
	NONE <input type="checkbox"/>	UNKNOWN <input type="checkbox"/>
FIRE ALARM STATUS: (One)	PRESENT/ACTIVATED <input type="checkbox"/>	PRESENT/NOT ACTIVATED <input type="checkbox"/>
	NONE <input type="checkbox"/>	UNKNOWN <input type="checkbox"/>
NAME OF DECEASED:		
DATE OF BIRTH:	SEX:	RACE:
PHYSICAL DISABILITY?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
If YES, please explain:		
LOCATION DECEASED FOUND:		
CONDITIONS OF HOARDING PRESENT?	YES <input type="checkbox"/>	NO <input type="checkbox"/>
CAUSE OF DEATH:		
AUTOPSY PERFORMED BY:		
REMARKS:		
INVESTIGATOR:		
AGENCY:		
REPORT DATE:		

PLEASE EMAIL COMPLETED FORM TO: StateFireMarshal@vdfp.virginia.gov
VDFP-SFMO - 001 (REV. 3/18)



Virginia Fire Death Reporting

- Data is reported to Secretary of Public Safety
- Data is used to develop trends of fire related deaths statewide
- Data is maintained in “real time” by the SFMO
- Your help is crucial in accurately reported data



2019/2020 SFMO Fireworks Statistics

➤ 2019 – 104 Stands Inspected

- 39 stands had illegal/non-permissible products
- 10,185 total illegal/non-permissible products

➤ 2020 – 128 Stands Inspected

- 46 stands had illegal/non-permissible products
- 13,271 total illegal/non-permissible products



2019 SFMO Permit Statistics

- Blasting Permits – 169
- Explosives Storage Permits – 32
- Aerial Fireworks – 31
- Outdoor Pyrotechnics (Football Games etc.) – 38
- Indoor Pyrotechnics (Concerts/Shows) – 72
- Bonfires – 27
- Special Events – 31



Virginia Permissible Fireworks



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Permissible Fireworks

COV § 27- 95

Any fountains that do not emit sparks or other burning effects to a distance greater than 16.4 feet; wheels that do not emit a flame radius greater than 39 inches; crackling devices and flashers or strobes that do not emit sparks or other burning effects to a distance greater than 78.74 inches; and sparkling devices or other fireworks devices that

- (i) do not explode or produce a report,
- (ii) do not travel horizontally or vertically under their own power,
- (iii) do not emit or function as a projectile,
- (iv) do not produce a continuous flame longer than 20 inches,
- (v) are not capable of being reloaded, and
- (vi) If designed to be ignited by a fuse, have a fuse that is protected to resist side ignition and a burning time of not less than four seconds and not more than eight seconds.



Virginia Permissible Fireworks List

- SFMO and Local Fire Marshals Developed
- SFMO Maintained
- Annual Testing and Evaluation
- American Fireworks Safety Laboratory (AFSL) Standards



Virginia Permissible Fireworks

2021 Season Timeline

- December (2020) - Process begins
- January – Draft submittal list due to SFMO-Special Ops
- February – Final submittal list due to SFMO Special Ops



Virginia Permissible Fireworks

2021 Season Timeline

- Late March – Test samples due to SFMO
- Early April – Product testing
- Late April – Final list published



Is this legal?



Is this legal?



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Is this legal?



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Fireworks Complaints

- Locate the responsible party
- Advise that they cannot possess
- Two routes of compliance
 - Cooperative: Surrender the illegal fireworks
 - Uncooperative: Seize the illegal fireworks and issue a criminal summons



Fire Marshal Authority

(2015) SFPC 5601.7

The fire official is authorized to remove or cause to be removed or disposed of in an approved manner, at the expense of the owner, fireworks offered or exposed for sale, stored, possessed or used in violation of the SFPC.



Violation a Misdemeanor

§ 27-100

It shall be unlawful for any owner or any other person, firm, or corporation, on or after the effective date of any Code provisions, to violate any provisions of the Fire Prevention Code. Any such violation shall be deemed a Class 1 misdemeanor, and any owner, or any other person, firm, or corporation convicted of such violation shall be punished in accordance with the provisions of § 18.2-11.



LEO Authority

§ 27-100.1. Seizure and destruction of certain fireworks.

Any law-enforcement officer arresting any person for a violation of this chapter related to fireworks shall seize any article of fireworks in the possession or under the control of the person so arrested and shall hold the same until final disposition of any criminal proceedings against such person. If a judgment of conviction be entered against such person, the court shall order destruction of such articles upon expiration of the time allowed for appeal of such judgment of conviction.



Disposal of Fireworks

➤ EPA Considerations

➤ DEQ Considerations

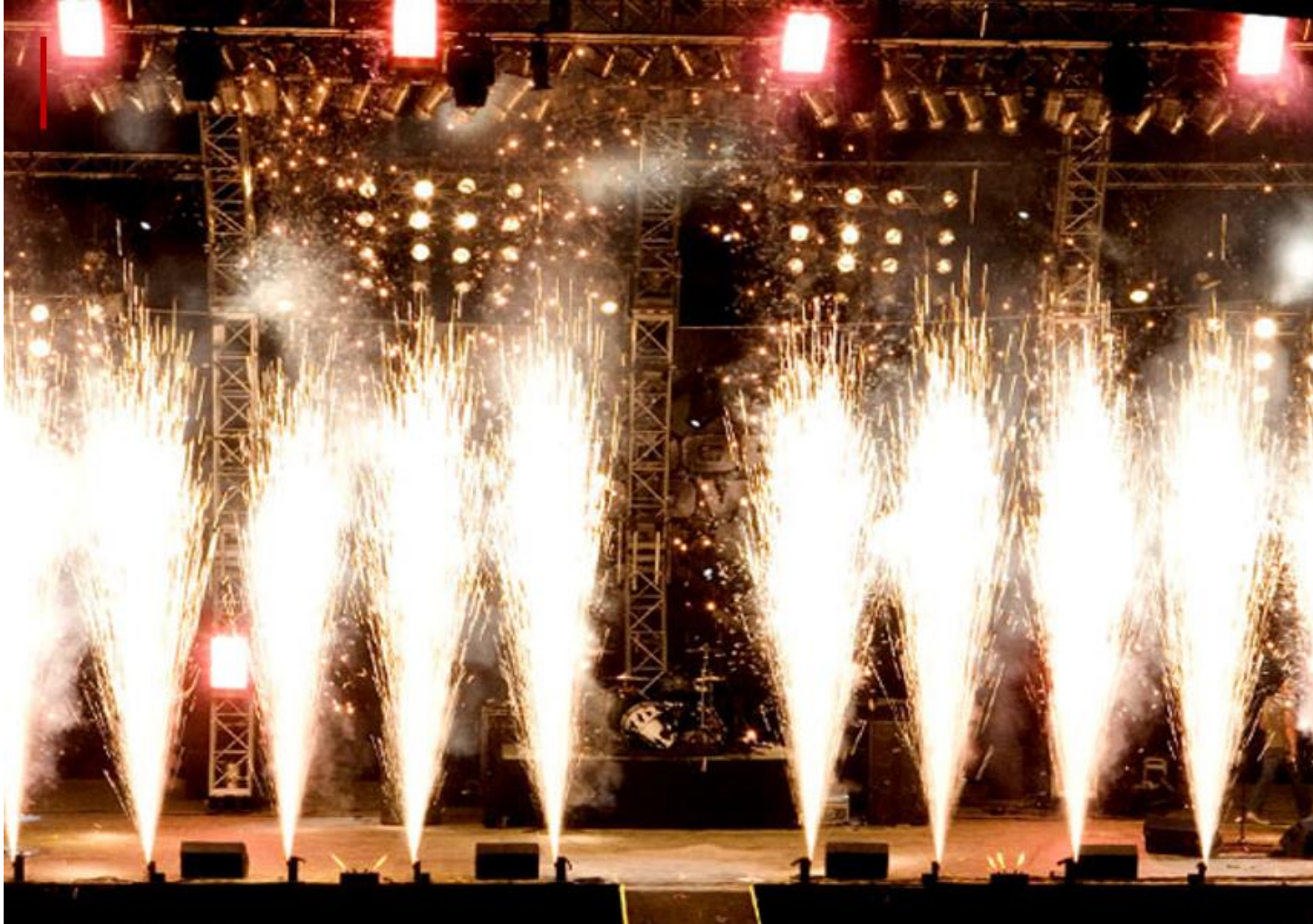


Ocracoke Island, NC – 2009

Three dead, two injured



Pyrotechnics and Flame Effects

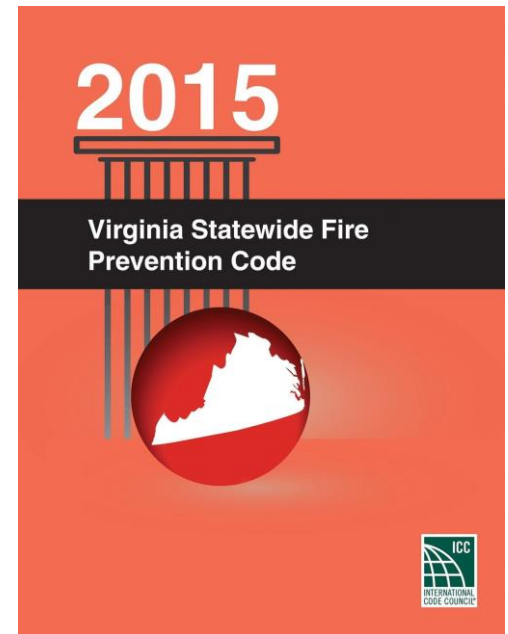


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Regulations

- Statewide Fire Prevention Code
- NFPA 1123 (14) Fireworks Display
- NFPA 1126 (11) Use of Pyrotechnics Before a Proximate Audience
- NFPA 495 (13) Explosives Material Code
- NFPA 160 (11) Use of Flame Effects Before an Audience
- NFPA 58 (14) Liquefied Petroleum Gas



Pyrotechnics

Use of pyrotechnics in the performing arts in conjunction with theatrical, musical, or similar productions before a proximate audience, performers, or support personnel.



Pyrotechnics

Fireworks



Pyrotechnics



Pyrotechnics

Can be used indoors and outdoors.

Outdoor use is when the required separation distance between spectators, buildings, etc. can not be obtained with the use of fireworks.



Separation Distance to Audience

- A minimum of 15 ft or twice the fallout radius of the device
- Concussion mortars and concussion effects shall be separated from the audience by a minimum of 25 ft
- No glowing or flaming particles within 10 ft of the audience



Devices and Materials

- No part, projectile, or debris from the pyrotechnic material or device shall be propelled so that it damages overhead properties, overhead equipment, or the ceiling and walls of the performance site.



Life Safety Systems



- Portions of fire detection and life safety systems shall be permitted to be interrupted during the operation:
- Approved by the AHJ
 - Approved by the owner or owner's agent
 - Presence of an approved fire watch capable of directing the operation of all fire detection and life safety systems installed in the building.



Life Safety Systems

- Where pyrotechnics requires smoke detectors to be bypassed, or air-handling systems to be disengaged, the FD shall be notified and a FD representative shall be present for the demonstration.
- The life safety systems of the building shall be returned to normal operating conditions as soon as the likelihood of false alarms has passed.



Pyrotechnic Equipment

- Instructions must be provided for use, including the ratings of the types and quantities of materials for those devices.
- Electrical firing systems instructions must be provided from the manufacture for the setup and use of the system with pyrotechnics.



Firing Systems

- All firing systems shall be designed to ensure against accidental firing by providing at least a 2-step interlock:
 1. Enables or arms the firing system, AND
 2. Deliberately applies firing power



Portable Firefighting Equipment

- Four or more extinguishers
- In all cases, at least 2 pressurized water extinguishers and 2 Class 10-BC extinguishers shall be provided.
- Extinguishers must be placed so that at least one is located on each opposing side of the performance where pyrotechnics are used.



Communications

- Pyrotechnic devices must be in clear view of the pyrotechnic operator or an assistant who is in direct communication with the operator.



Storage

- A separate, lockable room or facility for the preparation of pyrotechnic materials and devices.
- A closed vehicle, such as a truck is permitted to be used for storage.
- Pyrotechnic materials and devices cannot not be stored within 50 feet of any unprotected source of heat or open flame.



Mounting and Equipment

- Pyrotechnic devices must be mounted in a secure manner to maintain their proper positions and orientations.
- Pyrotechnic materials must be fired only from equipment specifically constructed for the purpose of firing pyrotechnic materials.



Pyrotechnic Holders



Performer Protection



Performer Protection

- Where a pyrotechnic special effect is placed on or in contact with a performer's body, a means of shielding or containment adequate to prevent any injury to the performer must be provided.
- This protection shall be sufficient to protect against the normal functioning of the pyrotechnic special effect as well as any possible malfunction.



Performer Protection

- Performers and support personnel must be advised when they will be exposed to a potentially hazardous situation
- Performers and support personnel familiar and experienced with the pyrotechnic effects are permitted to be in the area of a pyrotechnic effect, but only voluntarily.



Identification

➤ Marking

1. Name of the device or binary system
2. Name, address, & phone number of the manufacturer
3. Statement describing the conditions of use and potential hazards
4. Whether the device or binary system is intended for “indoor” use



Example Labels



ACME Pyrotechnics
123 South 45th Ave, Anytown, MN 56025
Phone: (372) 867-5309

DURATION GERB
1 SEC. BY 30 FT.

PROFESSIONAL USE ONLY
SUITABLE FOR INDOOR USE

1.4G UN0431 EX-2010123456



ACME Pyrotechnics
123 South 45th Ave, Anytown, MN 56025
Phone: (372) 867-5309

25MM COMET
100 FT.

PROFESSIONAL USE ONLY
FOR OUTDOOR USE ONLY

1.4G UN0431 EX-2010123457



Airburst

A pyrotechnic device designed to mimic an outdoor aerial firework shell without producing burning fallout.. They also create a popping sound that varies in loudness.



Binary Powder

A two-component powder which when separate, are a flammable solid and an oxidizer. When mixed together, they become a pyrotechnic composition. Effects vary, including but not limited to: Airburst, Concussion, Flash, Smoke, Fast and Slow Sparkle and Sparks.



Comet

A device containing a single pellet of self-consuming pyrotechnic composition. The comet is propelled into the air via a lifting charge producing various colors, glitter and crackle effects.



Flame Mortar (aka Flame Projector, Flame Column, Flame Ball)

This Pyrotechnic device often utilizes a smokeless powder based composition and produces a rising column or rolling ball of fire in various colors. This device produces very little smoke and minimal debris.



Gerb

A pyrotechnic fountain that produces a controlled spray (plume) of sparks. Most produce either silver or gold sparks. Still others have a crackle or glittering effect.



Waterfall (aka Falls, Cascades)

A pyrotechnic fountain producing a falling plume of sparks usually arranged in a line to mimic a waterfall.



Mine

A device containing multiple pellets (stars) of self-consuming pyrotechnic composition. The stars are propelled into the air via a lifting charge, producing various colors, glitter and crackle effects in an inverted cone pattern.



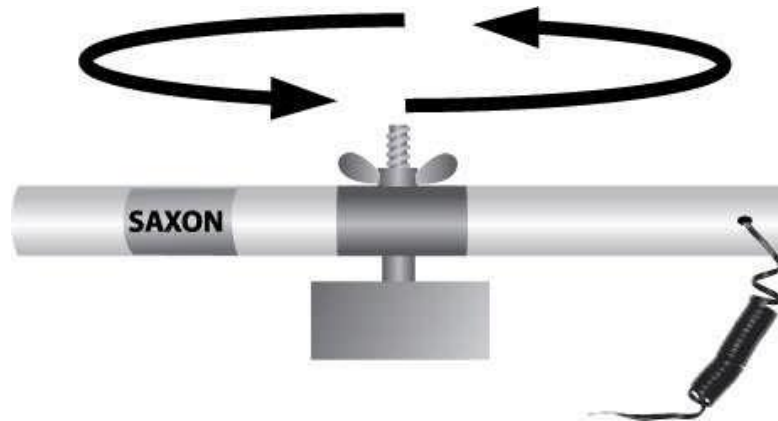
Robotics or “Spark” Effects

- Also known as Bullet Hits, Spark Hits or Spark Producing Devices.
- A pyrotechnic device, which simulates a short circuit in an electrical panel. These devices produce a spray of sparks.



Saxon (aka Pinwheel)

A device that produces a revolving shower of sparks spinning around a fixed axis. Device is usually mounted to a stand or holder with an axle or shaft with a keeper or pin to lock the device to the shaft.



Cold Spark Machines



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Cold Spark Machines

NFPA 1126 (16) 3.3.40 **Pyrotechnic Device.** Any device containing pyrotechnic materials or pyrotechnic effect simulation equipment, as described in the following definitions, and capable of producing a special effect as described in this standard.

NFPA 1126 (16) 3.3.41 **Pyrotechnic Effect Simulation Equipment.** Equipment that uses a chemical mixture, heat source, and the introduction of oxygen to initiate or maintain combustion and is used to produce visible or audible effects by combustion, deflagration, or detonation.



Cold Spark Machines

Should a permit be issued for the use?

Should an operator be a certified pyrotechnician?

YES!



Flame Effects



Flame Effects

The combustion of solids, liquids, or gases to produce thermal, physical, visual or audible phenomena.

- Automatic Flame Effects
- Manual Flame Effects
- Portable Flame Effects



Fire Protection and Life Safety Systems

- Portions of fire protection and life safety systems shall be permitted to be interrupted during the operation of temporary indoor flame effects when the following conditions are met:
- (1) Approval of the AHJ.
 - (2) Approval of the owner or owner's.
 - (3) An approved fire watch capable of directing the operation of all fire protection and life safety systems installed in the building is present.



Protective Clothing

- The flame effect performers, operators, and assistants must be protected by clothing or other means suitable for their exposure to flame effects.
- Documentation of fire resistance must be available.



General Requirements

All flame effect control systems shall be designed and installed to prevent accidental firing and unintentional release of fuel.



NFPA 58

- Where cylinders are used temporarily in buildings for flame effects before an audience
 - The maximum water capacity of individual cylinders shall be 48 lb (nominal 20 lb propane capacity)



NFPA 58

- If more than one cylinder is located in the same room, the cylinders must be separated by at least 20 feet.
- Where a separation of 20 ft (6.1 m) is not practical, reduction of distances may be permitted with the approval of the AHJ
- Cylinders shall not be connected or disconnected during the flame effect or performance



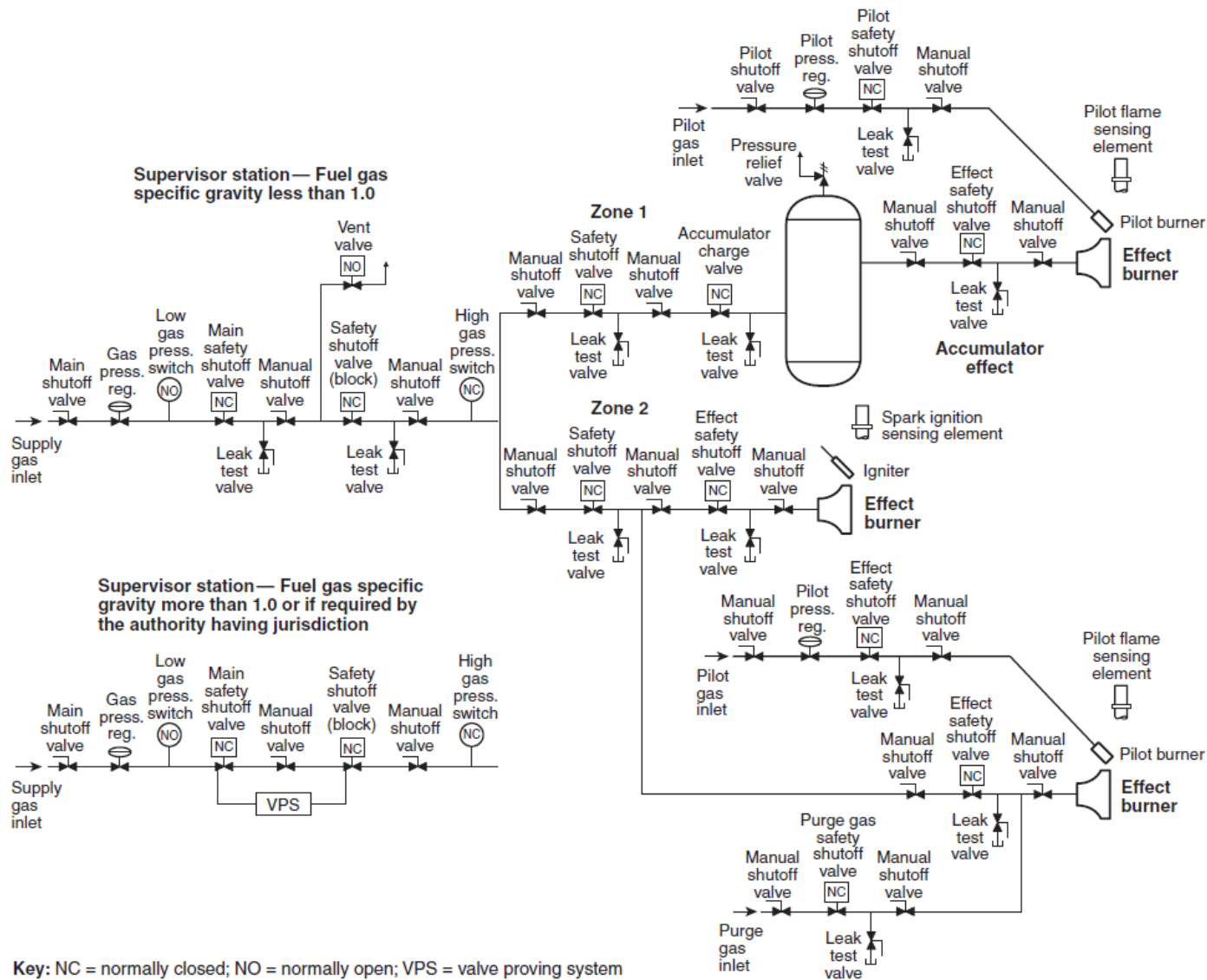


FIGURE A.9.3.2.4.1(3) Example of Various Flame Effect Control and Piping Components.



Fire Protection for Temporary Installations

- In all cases, at least 2 pressurized water extinguishers and 2 Class 10-BC extinguishers must be provided.
- Extinguishers must be placed so that at least one is located on each opposing side of the performance where pyrotechnics are used.



Example



Example



Large Scale Example



Questions?



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Contact Information



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