Summary of Discussion from State Fire Marshal's Public Display of Fireworks meeting with Industry Partners

April 16, 2018 - 1:30 p.m.

The purpose of this meeting was to meet with industry partners to ensure the permitting and inspections processes of the SC OSFM achieve the intended purpose of providing for the safety of the public during displays of fireworks.

Those in attendance included:

Paul Gaffney, Pyrotecnico
Kris Scott, Columbia Fire Department
Kent Scott, Columbia Fire Department
Ken Willis, Columbia Fire Department
Brent Fisher, Falcon Fireworks
Rudy Diaz, Bay Fireworks
Anthony Carter, East Coast Fireworks
Rick Tyler, Zambelli Fireworks
Steve Whitman, Greenville Fire Department
Brent Munnerlyn, Munnerlyn Fireworks
Ray Hoshall, OSFM
Susan Scoggin, OSFM
Shawn Stickle, OSFM
Nathan Ellis, OSFM

Members of Charleston Fire Department Fire Marshal Division were present via conference call.

Summary of Discussion:

I. Discuss current "Definition of a Public Display" - A display of consumer or special fireworks in which the liability extends beyond that of the shooter.

The group discussed the issue of how to define a public display: Is it determined by number of attendees? If so, what number? Is it determined by whether or not a show is advertised or if admission is charged? If so, what happens when the show is not advertised? Or, if it is a free event and hundreds or thousands of people are in attendance?

The OSFM currently has applied the following "rule of thumb": When the display of consumer or special fireworks involves the liability of more than one single individual, it is a public display and shall meet all of the requirements of the law and regulations. The group seemed to accept this current definition. OSFM will seek to codify that definition in the future.

II. Discuss the role of the local AHJ.

The requirement of the regulation is for the local AHJ to simply acknowledge that the fireworks display is occurring in his jurisdiction. However, the regulation requires the local AHJ to sign the permit. AHJ's are allowed to have additional requirements, such as permits or requiring payment for a fire crew on standby. Therefore, OSFM will not consider any permit applications until after obtaining the AHJ's signature. It is the event sponsor's responsibility to meet the requirements of the

local AHJ. If the event sponsor cannot satisfy the local AHJ, there is no reason the OSFM needs to consider the permit application or get involved.

III. Discuss the 2015 Letter on Racks.
The intent of this letter was meant to answer a specific question regarding wood framed racks with HDPE mortars. However, it has been misunderstood and misapplied by many industry partners as a requirement that racks be constructed in accordance with a prescriptive portion of an annex of the code or as to require mortars of other than HDPE in order to avoid the increased separation distances. These interpretations and applications of this letter are not consistent with its intent. This requirement will be loosely enforced through the 2018 fireworks season and will be readdressed by OSFM with a new position statement later this year.

The facts about the issue include that wood frame mortars with HDPE cannot withstand a catastrophic failure and the separation distance should be doubled from that of table 5.1.3.1 when more than three shells are chain fused.

NFPA 1123 (2014) A.4.6.1 states:

> *[…] Aboveground wood frame mortar racks with lightweight mortar materials such as paper, HDPE, or fiberglass generally will not withstand a catastrophic aerial shell malfunction in a mortar.*

NFPA 1123 (2014) 4.6 states:

> *Wherever more than three shells are to be chain fused, additional measures shall be required to prevent adjacent mortars from being repositioned in the event that a shell explodes in a mortar, causing it to burst.*

NFPA 1123 (2014) 4.6.1 4.6.1.2 states:

> *Where there is doubt concerning the strength of racks holding chain-fused mortars, the separation distances from those racks to spectators shall be twice those listed in Table 5.1.3.1 for the largest mortar in the sequence.*

For this season, OSFM will continue the practice of evaluating the condition of wooden racks and take into consideration other safety factors to determine if, as a worst case scenario, the distances should be doubled.

IV. Discuss Rack Stability: What methods of stabilizing racks are acceptable?
OSFM will not approve nylon or similar materials which will melt or burn when exposed to a low break. Racks should be stabilized in accordance with the following sections of NFPA 1123 (2014):

> *4.5.4 Mortar racks and bundles shall be constructed and installed to hold multiple mortars in position during normal functioning.*

4.5.5 The number of racks in a group of racks shall not be limited as long as the racks are securely fastened and stable.

4.5.6 Mortar racks or bundles that are not inherently stable shall be secured or braced by means of stakes, legs, A-frames, side-boards, or equivalent means.

Note that racks or bundles of racks may be found to be inherently stable without requiring additional bracing. Inspectors must use good judgement in determining the stability of racks and the potential for harm from failure.

V. Discuss Fallout Area: How is separation distance determined?
The group agreed that separation distance is determined by a horizontal distance (as opposed to vertical distance to an elevated display site). NFPA 1123 (2014) provides the following requirements for fallout area and separation distance:

NFPA 1123 (2014)

3.3.11 Fallout Area. The designated area in which hazardous debris is intended to fall after a pyrotechnic device is fired.*

A.3.3.11 Fallout Area. The shells burst over the area, and unsafe debris and malfunctioning aerial shells fall into this area. The fallout area is the location where a typical aerial shell dud falls to the ground, depending on the wind and the angle of mortar placement.

5.1.5.1 The fallout area shall be an open area.

5.1.5.2 Spectators, unauthorized vehicles, watercraft, or readily combustible materials shall not be located within the fallout area during the display.

5.2.1 The minimum spectator separation distance from the point of discharge of each firework shall be at least as great as those specified in this section.

It should be noted that 5.2.1 requires greater separation distances for elevated shoots. OSFM will attempt to gather accurate information regarding elevated shoots and apply the code as it is intended. Inspections of shows with elevated shooting locations will be a focus of future inspection efforts.

VI. Discuss when a display site becomes live.
Previous site inspections have brought to light the discussion of when do the separation distances required by NFPA 1123 become effective? In other words, when does the shoot become live?

This is not clearly identified in NFPA 1123. The group discussed the following requirements of NFPA 1123 (2014):

3.3.41.1 Discharge Site. The area immediately surrounding the location where fireworks and other devices are ignited for a display.

3.3.41.2 Display Site. The immediate area where a fireworks display is conducted, including the discharge site, the fallout area, and the required separation distance from mortars to spectator viewing areas, but not spectator viewing areas or vehicle parking areas.

4.2.2.2 Preparation area(s) for display fireworks shall be secured from public access by at least 100 ft (30 m).

4.2.2.3 Preparation area(s) shall have only authorized personnel in them at any time display fireworks are being prepared.

8.1.1 The sponsor shall consult with the AHJ and the operator to determine the level of fire protection required.

8.1.2 The following shall apply to crowd control: (1) Monitors whose sole duty is the enforcement of crowd control shall be located around the display site and at other locations as determined by the sponsor. (2) The AHJ and the operator shall approve the provisions for crowd control.

8.1.2.1 Monitors shall be positioned around the display site to prevent spectators or any other unauthorized persons from entering the discharge site.

8.1.2.2 Where required by the AHJ, approved delineators or barriers shall be used to aid in crowd control.

8.1.2.3 Portions of the display site, other than the discharge site(s), shall be permitted to be open to the public prior to the display as long as the provisions of 4.2.2.2 are maintained.

8.1.2.4 Unescorted public access to the discharge site shall not be permitted where pyrotechnic materials are present during the period before the display.

8.1.2.5 The discharge site shall be restricted throughout the display and until the discharge site has been inspected after the display.

8.1.3 The operator shall have primary responsibility for safety.*

8.1.3.1 The operator shall be responsible for ensuring that a sufficient number of assistants are available for the safe conduct of the fireworks display.*

8.1.3.2 Only the operator, authorized assistants, and inspector(s) representing the AHJ shall be permitted in the display site while the display is in progress.

Conclusion:
Every display site is different and thought must be given to the logistics of operating the display in determining how and when to restrict access to certain areas. In every case, the preparation areas must be secured from public access for, at least, 100 feet in each direction. Event sponsors and the operator share responsibilities for ensuring safety and security at the display site.

VII. Discuss the permit application and approval process.
The group in attendance was appreciative and complimentary of OSFM staff. In order to accurately determine proper separation distances at the time of permitting, they discussed the need for some additional information regarding type of mortar construction, firing method, and shell size. The purpose of this is to prevent circumstances that require doubling of separation distances at the time of site inspection. A new form is being developed and will be included in future application packages.

The group discussed the transition to an online renewal process for licenses and the potential to change the dates of the licensing period. The date change has been approved. License renewal will now be due on August 31 of even years. An online process will be in place that will include the ability to make payment and assign payment to a parent company online.

The group discussed the licensing requirement for trainees/assistants. There is no test required for a trainee/assistant license. The application package must include an ATF Letter of Clearance, fingerprint card, affidavit of eligibility, and an emailed passport style photo in jpeg format. It was discussed that everyone who works on the display site must hold the Trainee/Assistant license.

Additionally, the roles and responsibilities of the trainee/assistant license are best defined as that of an "Assistant" by NFPA 1123 Annex: *A.3.3.2 Assistant. The duties of an assistant include tasks such as setting up the equipment and fireworks, loading mortars (loader), spotting the bursting location of aerial shells (spotter), tending a ready box (ready box tender), igniting the fireworks (shooter), striking the equipment, and cleaning the discharge site.*

NFPA 1123 (2014) requires:
10.2 Assistants. All assistants shall be trained in the duties they are to perform, be under the direct supervision of the operator, and be at least 18 years old.

Since the meeting, in an effort to encourage display operators to ensure their assistants are licensed, OSFM has reduced the trainee/assistant license fee from $100 to $25.

VIII. Discuss the site inspection process.
The group stated OSFM staff is mostly professional and cooperative in an effort to ensure the public display of fireworks is conducted in a safe manner. It was noted no show has ever been canceled as a result of a site inspection. It is the goal of OSFM, in all cases, to make the show as safe as possible and allow the show to continue.

Field modifications of the permit conditions and/or display site may be approved by Deputy State Fire Marshals on site without the need of a Pyrotechnic Display Modification Request form. Modifications will not be approved when code required minimum separation distances or other safety concerns cannot be achieved. Deputies will note all modifications on a site inspection report.

The need to accurately train Deputy State Fire Marshal's and local AHJ's as to the requirements of NFPA 1123 was discussed. OSFM will continue to provide training to fire marshals, at least annually, on public fireworks displays.

In closing, special thanks goes to the pyrotechnic industry of South Carolina for partnering with OSFM to ensure the public displays of fireworks continue to be as safe and professional. We look forward to continued cooperation to make SC the national model for the safe enjoyment of pyrotechnics.

If you have any concerns or questions about these comments, please do not hesitate to contact me.

Sincerely,

Nathan Ellis
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