



FIREWORKS SAFETY STANDARDS STATUS REPORT

September 2011

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ATTACHMENTS

Tab A Federal Register Notice, 71 FR 39249, July 12, 2006.

Tab B Memorandum from James Joholske, Supervisory Compliance Investigator, to Dr. Christopher Musto, Project Manager, “Summary of the Fireworks Advanced Notice of Proposed Rulemaking (ANPR) Comments and Discussion of Options,” November 20, 2006.

Tab C Full comments received from the American Fireworks Standards Laboratory (AFSL), National Fire Protection Association (NFPA), International Fire Marshal’s Association and others.

Tab D Memorandum from Yongling Tu, Division of Hazard Analysis—Directorate for Epidemiology, and Demar V. Granados, Office of Compliance and Field Operations, to Dr. Christopher Musto, Project Manager, “2010 Fireworks Annual Report: Fireworks-Related Deaths, Emergency Department-Treated Injuries, And Enforcement Activities During 2010” June, 2011.

EXECUTIVE SUMMARY

The U.S. Consumer Product Safety Commission (“CPSC” or “Commission”) regulates consumer fireworks devices under the Federal Hazardous Substances Act (“FHSA”). 15 U.S.C. 1261–1278. Under its current regulations, the Commission has declared certain fireworks devices to be “banned hazardous substances,” (16 CFR §§ 1500.17(a)(3), (8), (9), (11) and (12)). Other fireworks devices must meet specific requirements to avoid being classified as banned hazardous substances, (16 CFR part 1507). Commission regulations also prescribe specific warnings required on various legal fireworks devices (16 CFR §1500.14(b)(7)), and designate the size and location of these warnings (16 CFR 1500.121).

On June 26, 2006, the Commission voted to issue an Advanced Notice of Proposed Rulemaking (ANPR) to amend fireworks safety standards as written in 16 CFR parts 1500 and 1507. The ANPR was published in the *Federal Register* on July 12, 2006 (71 FR 39249).

This status report describes the work done and the results of the staff effort since the issuance of the ANPR to evaluate the options listed in the FY 2006 ANPR. This status report summarizes for the Commission the information currently available and the relevant changes to the fireworks regulatory landscape since the ANPR was issued, as well as identifies a path for staff to develop additional information to brief the Commission.

In November 2006, James Joholske compiled a summary of the comments received for the fireworks ANPR, which is included in Tab A. A majority of the comments were related to the CPSC’s premise that the number of fireworks-related injuries were on the rise. Other comments focused on the amount of influence the American Fireworks Safety Laboratory (AFSL) would have if the CPSC required certification to the FHSA fireworks regulations and began relying on AFSL’s standards. Several organizations called for the outright ban of any and all consumer fireworks.

Updates to the death and injury data from 2009 to 2010 are included, in addition to injury trends since the publication of the FY 2006 ANPR (Tab C). Staff obtained information on fireworks-related deaths from news clippings and other sources in the CPSC’s Injury and Potential Injury Incident (IPII) database and the CPSC’s Death Certificate File. Staff estimated fireworks-related injuries from the CPSC’s National Electronic Injury Surveillance System (NEISS). More detailed analyses of injuries, including the type of injury, the fireworks involved, and the characteristics of the victim were based on a special study conducted by CPSC staff between June 18, 2010 and July 18, 2010. About 73 percent of the annual fireworks-related injuries for 2010 occurred during that period.

One significant change in the regulatory landscape for consumer fireworks since the issuance of the ANPR was the implementation of the Consumer Product Safety Improvement Act of 2008 (CPSIA). Section 102 of the CPSIA requires “... every manufacturer of a product which is subject to a consumer product safety rule under this Act or similar rule, ban, standard, or regulation under any other Act enforced by the Commission and which is imported for

consumption or warehousing or distributed in commerce (and the private labeler of such product if such product bears a private label) shall issue a certificate which—

‘(A) shall certify, based on a test of each product or upon a reasonable testing program, that such product complies with all rules, bans, standards, or regulations applicable to the product under this Act or any other Act enforced by the Commission; and

‘(B) shall specify each such rule, ban, standard, or regulation applicable to the product.’”

As resources are made available staff will consider available alternatives to update, modify, clarify, and/or strengthen current fireworks regulations toward a briefing package that will be submitted to the Commission upon scheduled completion of the work. Work will include:

- 1) Laboratory testing of the American Fireworks Safety Laboratory (AFSL) test procedure for black powder equivalency test;
- 2) Evaluation of current standards from multiple sources to determine which may be incorporated into a consensus standards package; and
- 3) Working with other divisions of the US CPSC (*e.g.*, EC, EP, OGC, CE) towards a briefing package.



**United States
CONSUMER PRODUCT SAFETY COMMISSION
4330 East West Highway
Bethesda, MD 20814**

MEMORANDUM

TO: Robert J. Howell
Deputy Executive Director, Safety Operations
Todd A. Stevenson, Secretary

THROUGH: J.J. DeWane Ray
Assistant Executive Director, Hazard Identification and Reduction

FROM: Dr. Christopher J Musto, Project Manager
Directorate for Laboratory Sciences
James Joholske, Supervisory Compliance Investigator

SUBJECT: Fireworks Regulations (ANPR FY 2006) Status Report

INTRODUCTION

The U.S. Consumer Product Safety Commission (“CPSC”) is considering whether there may be a need to update and strengthen its regulation of fireworks devices. An advanced notice of proposed rulemaking (“ANPR”) initiating a rulemaking proceeding under the Federal Hazardous Substances Act (“FHSA”) was issued on June 26, 2006. The ANPR can be found in Tab A. The ANPR identified the following possible alternatives to increase compliance with fireworks regulations and reduce the number of injuries associated with fireworks devices: (1) issue a rule requiring mandatory certification to the fireworks regulations under FHSA; (2) issue additional mandatory requirements that fireworks devices must meet; (3) rely on a voluntary standard; or (4) pursue corrective action on a case-by-case basis under section 15 of the FHSA.

CPSC regulations regarding fireworks devices (*e.g.*, 16 CFR 1500.17 and 1507) have come under some scrutiny for being vague and incomplete when considering the styles and contents of newer devices. This is noteworthy in the case of aerial devices where hybrid powders have replaced conventional black powder to enhance the expelling charge (break charge) and may also produce an audible effect. Rulemaking may be considered to clarify the language in these regulations. 16 CFR § 1500.17 (a)(3), for example, does not indicate clearly that the 130 mg (2 grain) audible effect composition limit applies only to aerial devices. This section also references ground devices, such as cherry bombs, M-80 salutes, silver salutes, and other large firecrackers which are subject to a more stringent ban of 50 mg (0.772 grains) under § 1500.17 (a)(8). In addition, § 1500.17 (a)(8) refers to aerial bombs, which are also listed under § 1500.17 (a)(3).

CPSC staff prepared this status report to provide the Commission with updated information on developments relevant to the ANPR, including the comments received during the open response period following the publication of the ANPR, updating the Commission on recent fireworks-related injuries, as well as changes in requirements due to the enactment of the Consumer Product Safety Improvement Act of 2008 (CPSIA).

CURRENT STATUS

One significant change in fireworks regulations is the requirement under CPSIA, Section 102 (a)(1) that manufacturers of consumer fireworks must issue General Conformity Certification based on a test of each product or upon a reasonable testing program, indicating that such product complies with all the rules, bans, standards, or regulations applicable to the product under any Act enforced by the Commission. This change deals explicitly with the first option considered by the ANPR.

Among the other alternatives being considered are the voluntary standards developed by the American Fireworks Safety Laboratory (AFSL). The AFSL standards incorporate both CPSC and U.S. Department of Transportation regulations, as well as a number of standards developed by AFSL that are in addition to federal requirements (Comments in Tab C).

Fireworks injuries continue to occur. According to the CPSC 2010 Fireworks Annual Report, CPSC staff received reports of three fireworks-related deaths during 2010 (Tab D). CPSC staff has reports of two fireworks-related deaths in 2009. Reporting is not complete for either year, and the actual number of deaths may be higher.

Fireworks were involved in an estimated 8,600 injuries treated in U.S. hospital emergency departments during calendar year 2010 (95 percent confidence interval 6,600–10,700). CPSC staff estimated that there were 8,800 fireworks-related injuries during 2009 (Tab D). The difference is not statistically significant.

There is not a statistically significant trend in estimated emergency department- treated injuries from 1996, when estimated injuries were the lowest (7,300), to 2010.

An estimated 6,300 fireworks-related injuries (or 73 percent of the total fireworks-related injuries) were treated in U.S. hospital emergency departments during the 1-month special study period between June 18, 2010 and July 18, 2010 (95 percent confidence interval 4,500–8,100). CPSC staff estimated that there were 5,900 fireworks-related injuries during the 2009 special study period.

ANPR Comments

A total of 43 comments were received in response to the ANPR, which was published in the *Federal Register*, Vol. 71, No. 133, on July 12, 2006. They are summarized in Tab A. Additionally, the comments from the American Fireworks Standards Laboratory (AFSL) and from the National Fire Protection Association (NFPA) and others are provided in Tab B.

Incident Data

In June 2011, Yongling Tu of the Division of Hazard Analysis, along with Demar Granados from the Office of Compliance, released the 2010 Fireworks Annual Report which can be found in Tab C, www.cpsc.gov/LIBRARY/2010fwreport.pdf. A summary of their findings is discussed below, along with supporting tables and figures.

Highlights of the report are as follows:

- CPSC staff received reports of three fireworks-related deaths during 2010. In the first incident, a 22-year-old male died after he fell from a cliff when he detonated unspecified fireworks. In the second incident, a 49-year-old male perished when the fireworks he made illegally in his garage exploded. In the third incident, a 55-year-old male died in a house explosion caused by teenagers' mischievous use of Roman candles. CPSC staff has reports of two fireworks-related deaths in 2009. Reporting is not complete for either year, and the actual number of deaths may be higher.
- Fireworks were involved in an estimated 8,600 injuries treated in U.S. hospital emergency departments during calendar year 2010 (95 percent confidence interval 6,600–10,700). CPSC staff estimated that there were 8,800 fireworks-related injuries during 2009. The difference is not statistically significant.
- There is not a statistically significant trend in estimated emergency department- treated injuries from 1996, when estimated injuries were the lowest (7,300), to 2010.
- An estimated 6,300 fireworks-related injuries (or 73 percent of the total fireworks-related injuries) were treated in U.S. hospital emergency departments during the 1-month special study period between June 18, 2010 and July 18, 2010 (95 percent confidence interval 4,500–8,100). CPSC staff estimated that there were 5,900 fireworks-related injuries during the 2009 special study period.
- Of the fireworks-related injuries sustained, 65 percent were to males, and 35 percent were to females.
- Injuries to children were a major component of total fireworks-related injuries, with children under 15 years of age accounting for approximately 40 percent of the estimated injuries. Fifty-three percent of the estimated emergency department-treated, fireworks-related injuries were individuals younger than 20 years of age.

- There were an estimated 900 injuries associated with firecrackers. Of these, an estimated 30 percent were associated with small firecrackers, 17 percent with illegal firecrackers, and 53 percent with unspecified firecrackers.
- There were an estimated 1,200 injuries associated with sparklers and 400 with bottle rockets.
- The parts of the body most often injured were hands and fingers (estimated 30 percent); legs (estimated 22 percent); eyes (estimated 21 percent); and head, face, and ears (estimated 16 percent).
- More than half of the injuries were burns. Burns were the most common injury to all parts of the body except the eyes, where contusions, lacerations, and foreign bodies in the eyes occurred more frequently.
- Most patients were treated at the emergency department and then released. An estimated 7 percent of patients were treated and transferred to another hospital or admitted to the hospital.

Figure 1 below shows the trend of the estimated number of non-occupational, fireworks-related injuries that were treated in U.S. hospital emergency departments between 1996 and 2010.

Figure 1
Estimated Fireworks-Related, Emergency Department-Treated Injuries
1991–2010

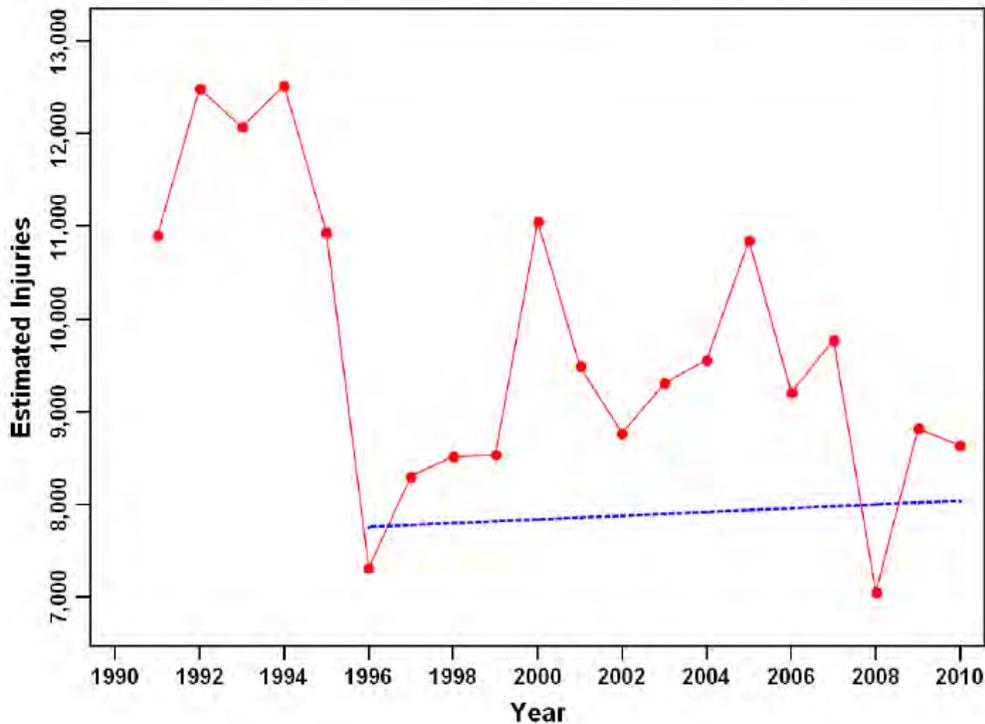


Table A-1 shows that the amount of consumer fireworks imported into the United States has increased over the period 1997–2008, peaking in 2005 at 275.1 million pounds, and then declining to 199.3 million pounds in 2009. Fireworks imports in 2010, 199.6 million pounds, were a little higher than they were in 2009. The number of estimated emergency department-treated injuries has fluctuated between 7,000 and 11,000, with the largest number of injuries occurring in the millennium year of 2000. During this period, as shown in Table A-1 below, the number of injuries per 100,000 pounds of fireworks has declined from 8.0 injuries per 100,000 pounds in 1997, to 3.4 injuries per 100,000 pounds in 2006 and 2008.

Injuries per 100,000 pounds were slightly lower in 2010, than the previous year at 4.3 injuries per 100,000 pounds.

Table A-1
 Estimated Fireworks-Related Injuries and
 Estimated Fireworks Imported into the U.S. 1996–2010

Year	Estimated Injuries	Estimated Fireworks	
		Imports (millions of pounds)	Injuries Per 100,000 Pounds
2010	8,600	199.6	4.3
2009	8,800	199.3	4.4
2008	7,000	208.3	3.4
2007	9,800	260.1	3.8
2006	9,200	272.1	3.4
2005	10,800	275.1	3.9
2004	9,600	230.0	4.2
2003	9,300	214.6	4.3
2002	8,800	175.3	5.0
2001	9,500	155.3	6.1
2000	11,000	146.2	7.5
1999	8,500	146.7	5.8
1998	8,500	123.8	6.9
1997	8,300	103.5	8.0
1996	7,300	108.6	6.7

Source: Injuries from NEISS, U.S. Consumer Product Safety Commission/EPHA. See Table 1 for further details. Estimated fireworks imports from the U.S. International Trade Commission, using Harmonized Tariff Schedule (HTS code 3604.10). Imports include consumer fireworks (1.4G HTS code 3604.10.90.10 and 3604.10.90.50) and display fireworks (1.3G HTS code 3604.10.10.00). Display fireworks were about 7.4 percent of the total imports in 2010. In addition to imported fireworks used in the United States, there is also a small amount of fireworks manufactured in the United States for domestic consumption, which is not available from the International Trade Commission and not shown in this table.

Voluntary Standards

Several organizations, including the United Nations, the American Pyrotechnics Association, and the American Fireworks Safety Laboratory, among others have published and continue to update and revise voluntary standards regarding fireworks and similar devices. Currently, the US Department of Transportation depends on standards written by the APA. These voluntary standards can be assembled by choosing desired sections from several publications or can be adopted en masse.

Conclusion

In June 2011 the Commission directed staff to review progress made since the issuance of the FY 2006 ANPR regarding consumer fireworks regulations and provide the Commission with this status report. Unless delayed until FY2013, during FY 2012, staff will begin to develop options and alternatives to update, modify, clarify, and/or strengthen current fireworks

regulations toward a briefing package that will be submitted to the Commission during FY 2014. A work plan will be drafted, and most of the early work during FY 2012 will consist of the development and integration of a break charge testing platform. Staff will begin a systematic review process to evaluate the current fireworks regulations and identify key omissions, as well as possible available standards capable of satisfying those gaps. Below are the three main goals outlined for the next year:

- 1) Laboratory testing of the American Fireworks Safety Laboratory (AFSL) test procedure for black powder equivalency test;
- 2) Evaluation of CPSC, AFSL and other current standards from multiple sources to determine which may be incorporated into a proposed revised standards package; and
- 3) Working with other divisions of the US CPSC (*e.g.*, EC, EP, OGC, CE) toward a briefing package with recommendations for updating the CPSC's fireworks regulations.

Tab A

Devices; (8) Reloadable Tube Aerial Shells; (9) Roman Candles; (10) Sky Rockets, Missiles, and Helicopters; (11) Hand-held Sparkling Devices; and (12) Wheels.

According to a June 27th 2005 press release from the U.S. Census Bureau, the value of fireworks imported from China into the United States in 2004 was \$164.2 million. This represented the bulk of all U.S. firework imports (\$172.5 million). By comparison, U.S. exports of fireworks came to just \$14.3 million.

The CPSC staff regularly samples fireworks imports and tests these samples to determine compliance with the regulations set forth in 16 CFR Part 1507. While the overall percentage rate of compliance of tested fireworks remained relatively steady in the years 2002 through 2004 (71%, 73%, and 72%), the compliance rate dropped to just 59% of the fireworks tested in 2005. Fireworks that had been certified to the AFSL voluntary standard enjoyed a significantly higher percentage of compliance with CPSC standards, *i.e.*, 83% compliance in 2005.

C. The Risk of Injury

In the past few years, there has been an increase in the estimated number of injuries due to fireworks devices. In the Commission's 2005 Fireworks Annual Report, fireworks devices were involved in an estimated 10,800 injuries requiring treatment in U.S. hospital emergency departments, as compared to 9,600 in 2004, 9,300 in 2003, and 8,000 in 2002. According to that report, the Commission had reports of four deaths associated with fireworks during 2005. During 2004, the Commission received reports of eight deaths associated with fireworks. During a one month special study between June 18, 2005 and July 18, 2005, an estimated 6,500 fireworks related injuries were treated in U.S. hospital emergency departments² (compared with 6,600 injuries in the 2004 special study and 6,800 injuries during the 2003 special study period).

The results of the one-month special study conducted in 2005 by CPSC staff showed that: injuries to children were a major component of total fireworks-related injuries with children under 15 accounting for 45 percent of the estimated injuries; children and young adults under 20 had 55 percent of the estimated injuries; there were an estimated 100 injuries at public fireworks displays; the parts of the body most often injured were hands (estimated 2,000 injuries), eyes (1,600 injuries) and the head, face and ear (1,300 injuries); and more than half of

the injuries involved burns. Burns were the most common injury to all parts of the body except the eyes, where contusions, lacerations, and foreign bodies in the eye occurred more frequently.

D. Relevant Statutory Provisions

This advance notice of proposed rulemaking initiates a rulemaking proceeding under the FHSA. Section 3 of the FHSA specifies the procedure the Commission follows to issue a mandatory consumer product safety standard. The Commission commences the rulemaking by issuing an ANPR, which must identify the product and the risk of injury, summarize regulatory alternatives, and invite comments or suggested standards from the public. 15 U.S.C. 1262(f). After considering any comments submitted in response to the ANPR, the Commission will decide whether to issue a proposed rule and a preliminary regulatory analysis in accordance with section 3(h) of the FHSA.

If a proposed rule is issued, the Commission would then consider the comments received in response to the proposed rule in deciding whether to issue a final rule and a final regulatory analysis. 15 U.S.C. 1262(i).

Additionally, Section 10 of the FHSA provides the Commission with authority to "promulgate regulations for the efficient enforcement of [the FHSA]." One option the Commission has under this provision is to issue a rule requiring mandatory certification to the fireworks device regulations of the FHSA.

E. Existing Standards

The Commission regulates fireworks devices under the Federal Hazardous Substances Act ("FHSA"). 15 U.S.C. 1261-1278. Under its current regulations, the Commission has declared certain fireworks devices to be "banned hazardous substances." 16 CFR Parts 1500.17(a)(3), (8), (9), (11) and (12). Other fireworks devices must meet specific requirements to avoid being classified as banned hazardous substances. 16 CFR Part 1507. Commission regulations also prescribe specific warnings required on various legal fireworks devices, 16 CFR 1500.14(b)(7), and designate the size and location of these warnings. 16 CFR 1500.121.

The American Fireworks Standards Laboratory (AFSL) developed performance and labeling standards for twelve categories of consumer fireworks devices. These twelve categories are: (1) Combination items; (2) comets, mines, and shells; (3) firecrackers; (4) fountains; (5) ground spinners and

chasers; (6) specialty items; (7) party, trick, and toy smoke devices; (8) reloadable tube aerial shells; (9) roman candles; (10) sky rockets, missiles, and helicopters; (11) hand-held sparkling devices; and (12) wheels. According to AFSL, the standards were developed by a Standards Committee representing various segments of the fireworks industry, Federal and state regulatory authorities, consumers, and technical experts. The AFSL standards incorporate both CPSC and Department of Transportation mandatory regulations as well as a number of standards developed by AFSL that are in addition to Federal requirements.

The Department of Transportation incorporates by reference the American Pyrotechnics Association Standard 87-1 ("Standard") as part of its regulations. The Standard applies to fireworks devices, pyrotechnic articles, and novelties for entertainment purposes, and is designed to enable manufacturers, importers and distributors of fireworks and novelties to provide their customers with products that can be transported and used safely and without unreasonable risk.

F. Regulatory and Non-Regulatory Alternatives To Address the Risks of Injury

One or more of the following alternatives could be used to reduce the identified risks associated with fireworks devices.

1. *Mandatory Certification.* The Commission could issue a rule requiring mandatory certification to the fireworks device regulations of the FHSA. This would encourage manufacturers to conduct testing or make use of independent testing laboratories as a basis for certification.

2. *Mandatory Standard.* The Commission could issue a rule specifying certain additional requirements fireworks devices must meet. The Commission is required to invite any person to submit to the Commission an existing standard or a portion of a standard as a proposed regulation under section 2(q)(1) or section 3(e) of the Federal Hazardous Substances Act. (15 U.S.C. 1262(f)(5)). If the Commission determines that any standard submitted to it in response to this invitation if promulgated (in whole, in part, or in combination with any other standard submitted to the Commission) as a regulation under the FHSA would eliminate or adequately reduce the risk of injury, the Commission may publish the standard, in whole, in part, or in such combination and with nonmaterial

² 95 percent confidence interval 4,900-8,100.

modifications, as a proposed regulation. (15 U.S.C. 1262(g)(1)).

3. *Reliance on Voluntary Standard.* The Commission is required to consider voluntary standards in its mandatory rulemaking. Specifically, the Commission is required to invite any person to submit to the Commission a statement of intention to modify or develop a voluntary standard to address a risk of injury together with a description of a plan to modify or develop the standard. (15 U.S.C. 1262(f)(6)). If the Commission determines that compliance with a standard submitted to it in response to this invitation is likely to result in the elimination or adequate reduction of the risk of injury identified in the notice, and it is likely that there will be substantial compliance with such standard, then the Commission must terminate the proceeding to promulgate a regulation and publish a notice in the **Federal Register** which includes the determination of the Commission and notifies the public that the Commission will rely on the voluntary standard to eliminate or reduce the risk of injury. Before relying upon any voluntary standard, the Commission must afford interested parties a reasonable opportunity to submit written comments regarding such standard. The Commission must consider such comments in making any determination regarding reliance on the involved voluntary standard.

4. *Corrective Actions Under Section 15 of the FHSA.* The Commission has authority under section 15 of the FHSA, 15 U.S.C. 1274, to pursue corrective actions on a case-by-case basis if the Commission determines that a product constitutes a banned hazardous substance.

G. Request for Information and Comments

In accordance with section 3(f) of the FHSA, the Commission solicits:

1. Written comments with respect to the risk of injury identified by the Commission.
 2. Written comments regarding the regulatory alternatives being considered and other possible alternatives for addressing the risk.
 3. Any existing standard or portion of a standard which could be issued as a proposed regulation.
 4. A statement of intention to modify or develop a voluntary standard to address the risk of injury discussed in this notice, along with a description of a plan (including a schedule) to do so.
- In addition, the Commission is interested in receiving information about the testing that is conducted on

fireworks before they are distributed, the costs associated with testing, and the impact that testing has on both compliance with the CPSC mandatory fireworks device regulations and on injuries.

Comments should be e-mailed to cpsc-os@cpsc.gov, and should be captioned "FIREWORKS ANPR." Comments may also be mailed, preferably in five copies, to the Office of the Secretary, Consumer Product Safety Commission, Room 502, 4330 East-West Highway, Bethesda, MD 20814, or delivered to the same address (telephone (301) 504-0800). Comments also may be filed by telefacsimile to (301) 504-0127. All comments and submissions should be received no later than September 11, 2006.

Dated: July 5, 2006.

Todd A. Stevenson,
Secretary, Consumer Product Safety Commission.
[FR Doc. E6-10881 Filed 7-11-06; 8:45 am]
BILLING CODE 6355-01-P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

18 CFR Parts 35 and 37

[Docket Nos. RM05-25-000 and RM05-17-000]

Preventing Undue Discrimination and Preference in Transmission Service

June 19, 2006.
AGENCY: Federal Energy Regulatory Commission.
ACTION: Notice of Proposed Rulemaking; extension of comment period.

SUMMARY: On May 19, 2006, the Commission issued a notice of proposed rulemaking proposing amendments to its regulations adopted in Order Nos. 888 and 889, and to the *pro forma* open access transmission tariff, to ensure that transmission services are provided on a basis that is just, reasonable and not unduly discriminatory or preferential, 70 FR 32635, June 6, 2006. The reply comment period is being extended at the request of the Edison Electric Institute.

DATES: Reply comments are due September 20, 2006.

ADDRESSES: You may submit comments, identified by Docket Nos. RM05-25-000 and RM05-17-000, by one of the following methods:

- Agency Web site: <http://www.ferc.gov>. Follow the instructions for submitting comments via the eFiling

link found in the Comment Procedures section of the preamble.

- Mail: Commenters unable to file comments electronically must mail or hand deliver an original and 14 copies of their comments to: Federal Energy Regulatory Commission, Office of the Secretary, 888 First Street, NE., Washington, DC 20426. Please refer to the Comment Procedures section of the preamble for additional information on how to file paper comments.

FOR FURTHER INFORMATION CONTACT:

Daniel Hedberg (Technical Information), Office of Energy Markets and Reliability, Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, (202) 502-6243.

Kathleen Barrón (Legal Information), Office of the General Counsel—Energy Markets, Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, (202) 502-6461.

David Withnell (Legal Information), Office of the General Counsel—Energy Markets, Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, (202) 502-8421.

SUPPLEMENTARY INFORMATION:

Notice Extending Reply Comment Period

On June 16, 2006, Edison Electric Institute filed a motion for an extension of time to file reply comments in response to the Commission's Notice of Proposed Rulemaking issued May 19, 2006 in the above-docketed proceeding, Preventing Undue Discrimination and Preference in Transmission Service, 115 FERC ¶ 61,211 (2006). Upon consideration, the date for filing reply comments in this proceeding is extended to and including September 20, 2006.

Magalie R. Salas,
Secretary.

[FR Doc. E6-10724 Filed 7-11-06; 8:45 am]
BILLING CODE 6717-01-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R09-OAR-2006-0526; FRL-8192-3]

Approval and Promulgation of Implementation Plans; Arizona—Phoenix PM-10 Nonattainment Area; Salt River Area Plan for Attainment of the 24-Hour PM-10 Standard

AGENCY: Environmental Protection Agency (EPA).

Tab B

Summary of the Fireworks Advanced Notice of Proposed Rulemaking (ANPR) Comments and Discussion of Options

11/20/2006 1:00 PM

ANPR Comments–Highlights

A total of 43 comments were received in response to the ANPR, which was published in the *Federal Register*, Vol. 71, No. 133, on July 12, 2006.

- A majority of the commenters CPSC's premise that fireworks-related injuries are increasing. Many of the comments cite injury statistics based on the number of pounds of fireworks consumed. When doing so, they point out that injuries, when compared to consumption, have declined significantly over the years.
- AFSL points out that the CPSC's violation data is not statistically representative, as sampling is limited, and past violators are targeted at import.
- A number of commenters expressed reservations about the amount of influence AFSL would have if CPSC required certification to the FHSAs fireworks regulations and began relying on AFSL's standards. Some commenters imply that the companies that comprise the AFSL board of directors would use their influence to gain additional market share and push out their competitors.
- A number of commenters expressed concern that choosing to rely formally on the AFSL standards could create a situation where ITS (the company that does the testing for AFSL) is the only firm authorized to test fireworks. The commenters suggested that other testing organizations also should be allowed to test and certify fireworks to the AFSL standards.
- Some of the commenters stated that the AFSL standards are too ambiguous to be enforced in a fair manner. Further, the commenters felt that too much discretion is left in the hands of the individual AFSL testers. In its comments, Black Cat provided examples of AFSL standards that it believes are ambiguous and/or were not developed with sufficient research or testing.
- One commenter implied there is no data that demonstrates a correlation between compliance with fireworks regulations and reduction of injuries. Further, misuse by the end user is more likely to be the actual cause of a fireworks-related injury.
- Three organizations (American Academy of Pediatrics, International Fire Marshal's Association, and National Fire Protection Association) all indicated that they oppose the use of fireworks by consumers and felt that all consumer fireworks should be banned.
- Three comments were outside the scope of the ANPR, focusing on CPSC's work in the area of stopping the sale of chemicals and components used to make banned fireworks.

Possible Alternatives Outlined in the ANPR

The ANPR identified the following possible alternatives to increase compliance with fireworks regulations and to reduce the number of injuries associated with fireworks devices:

- (1) Issue a rule requiring mandatory certification to the fireworks regulations under the FHSA;
- (2) Issue additional mandatory requirements that fireworks devices must meet;
- (3) Rely on a voluntary standard;
- (4) Pursue corrective action on a case-by-case basis under section 15 of the FHSA.

Discussion of Possible Alternatives

(1) Mandatory Certification—Section 10 of the FHSA provides the Commission with authority to “promulgate regulations for the efficient enforcement of [the FHSA].” Under this provision, the Commission has the option to issue a rule requiring mandatory certification to the fireworks device regulations of the FHSA.

CPSC’s import surveillance program has generally found that AFSL-tested products have a higher rate of compliance with mandatory standards than fireworks not subjected to third party testing. For example, in 2005, the compliance rate for fireworks tested by CPSC, which were previously certified by AFSL was 83 percent compared to 53 percent for those items not AFSL tested. In FY 2004, 86 percent of previously AFSL tested product was found to be in compliance with CPSC regulations compared to 66 percent for non-AFSL tested items. If the Commission decides to require mandatory certification to the fireworks regulations under FHSA, these results would support a requirement that the certification must be performed by an independent third party.

Those who commented on this subject were clear that the ability to test and certify fireworks should be open to more than just AFSL’s testing lab. Because the CPSC cannot endorse or recommend any particular company, testing and certification would be open to any firm that meets potential criteria set forth by the Commission.

Outstanding questions:

- Should a certification requirement be initiated under section 10 of the FHSA or section 30(d) of the CPSA? Which would give us stronger authority?
- Do we have authority to require third party certification? Section 14 of the CPSA states that inspection by a third party is optional. LHAMA, which is regulated under the FHSA, set up guidelines for certifying organizations (§1500.14), but the guidelines are not mandatory.

- What cost/benefit findings have to be made? Cost to third-party test fireworks generally runs approximately \$0.45 to \$0.50 a carton.
- What standards would a company be required to meet in order to become a third party tester?
- How can CPSC enforce lab certification standards when testing labs are overseas?

(2) Mandatory Regulations – The Commission has the option to issue new mandatory fireworks regulations under the FHSA. Commenters did not express strong opinions on this issue. Staff could select any of the AFSL standards that we feel impact safety; however, we may have problems producing data that sufficiently supports our selection. The Commission may also decide that this is the appropriate opportunity to address other risks through new requirements or updating existing regulations.

Sparklers: Sparklers are generally one of the top three injury producers each year. With the exception of the prohibition on the use of certain chemicals, the CPSC does not have any construction or performance requirements for this product. AFSL has a dynamic test for sparklers, and there is a British standard that also addresses performance issues. Either of these may be candidates for a new mandatory regulation.

Aerial Fireworks: The CPSC does not have mandatory requirements that address issues related to the minimum height aerial fireworks devices must function. This may be another area for consideration of new mandatory regulations.

Bottle Rockets: Along with sparklers and firecrackers, bottle rockets are usually one of the top three injury producers each year. Although we do see failures of the stick rigidity and straightness requirements at 16 CFR § 1507.10, we also see a number of injuries each year where it is clear that the bottle rockets were misused by the consumer. Bottle rockets tend to be used in bottle rocket “wars,” where kids intentionally shoot these devices at each other. Consumers also tend to ignore the labeling instructions and hold the rockets in their hands. It may be worth considering whether these items should be banned completely as a consumer firework.

Clarify the language in 16 CFR § 1500.17 (a)(3) and (a)(8): Rulemaking may be the appropriate time to clarify the language in these regulations. 16 CFR § 1500.17 (a)(3), for example, does not indicate clearly that the 130 mg report composition limit applies to aerial devices. This section also references ground devices, such as cherry bombs, M-80 salutes, silver salutes, and other large firecrackers. These devices would be more appropriately listed under § 1500.17 (a)(8). In addition, § 1500.17 (a)(8) refers to aerial bombs, which should be listed under § 1500.17 (a)(3).

Test Procedure for determining if a “report” is present: 16 CFR § 1500.17(a)(3) places limits on the amount of pyrotechnic composition “... intended to produce audible effects.” Currently, the test to determine if an audible effect is present in a fireworks device involves firing the device and listening to determine if the sound produced when

the aerial shell breaks open was intended to produce an audible effect or is simply a “break” or “burst” charge, which is the sound created by the composition that is used to break open the shell. The CPSC has been criticized in the past for this test method being too subjective. The question is whether this would be the appropriate time and place to work toward developing a more objective test, possibly based on the explosive force of the device. In addition, an “explosive force” test would be likely to address more directly the risk to consumers.

(3) Reliance by the Commission on a voluntary standard – AFSL was the only group to propose a specific voluntary standard for consideration by the Commission. In order to rely on a voluntary standard under section 9 of the CPSA, the Commission must determine that compliance with the standard is likely to result in eliminations or adequate reductions of the risk of injury identified in the notice, and it is likely that there will be substantial compliance with that standard.

Outstanding questions:

- What does reliance on a voluntary standard mean? Does it just trigger a reporting obligation under section 15 of the CPSA? Could fireworks that fail to comply with the relied upon voluntary standard be treated like banned hazardous substances, or would we have to prove a defect and an SPH in every case?
- If a firm simply has to report to us, would they be required to tell us specifically which AFSL standard(s) their product does not meet?
- Should we rely on the entire AFSL standard or just selected ones?
- What constitutes “substantial compliance?” AFSL estimates 80 percent of fireworks imported into the United States are tested to the AFSL standards. The 80 percent figure most likely refers to the percentage of fireworks that are imported by AFSL members. Some of these fireworks, while imported by an AFSL member, have not been subjected to testing by AFSL. How would we gauge future conformance rates?
- What burden would have to be overcome in relation to showing an elimination or adequate reduction of a hazard to consumers?

(4) Pursue corrective actions under section 15 of the FHSA – It is unclear why this was listed as an option in the ANPR because the CPSC already conducts corrective actions under section 15 of the CPSA in the area of fireworks.

Tab C



American Fireworks Standards Laboratory

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September 11, 2006

Mr. Todd Stevenson
Office of the Secretary
U.S. Consumer Product Safety Commission
4330 East West Highway
Bethesda, MD 20814-4408

Re: Comments on Fireworks ANPR

Dear Mr. Stevenson:

The American Fireworks Standards Laboratory (“AFSL”) is pleased to submit comments to the Consumer Product Safety Commission (“CPSC”) on the Advance Notice of Proposed Rulemaking (“ANPR”) issued by the Commission on July 11, 2006 (71 Fed. Reg. 39249) announcing the CPSC’s intent to review and possibly revise its existing fireworks regulations located at 16 C.F.R. §§ 1500 and 1507.

AFSL is a nonprofit corporation organized by members of the fireworks industry to establish voluntary safety standards for the design and performance of consumer fireworks and to certify fireworks that meet those standards. Since 1990, AFSL’s voluntary standards development and certification activities have effectively supplemented and strengthened the CPSC’s efforts to protect consumer safety.¹ Close collaboration between AFSL and the CPSC has benefited both entities, along with consumers, by facilitating the efficient targeting of resources to address high priority fireworks safety issues. As a result, most consumer fireworks sold in the U.S. today meet or exceed the stringent regulations and safety standards of both the CPSC and AFSL.

Nevertheless, the substantial progress made by the CPSC and AFSL to improve fireworks safety is incomplete. In particular, among fireworks companies that do not participate in AFSL’s voluntary testing and certification program, the rate of noncompliance with the CPSC’s mandatory safety regulations remains at an unacceptable level. As discussed in more detail

¹ Descriptions of AFSL, its voluntary standards, and its testing and certification program are provided in the enclosed Appendices.

below, we believe that this situation can be addressed effectively by the CPSC through an integrated, three-part strategy that combines:

- mandatory testing by fireworks companies to certify that their consumer products comply with the CPSC's existing fireworks regulations;
- formal reliance by the CPSC on the AFSL's voluntary standards; and
- application of the reporting requirements contained in Section 15 of the Consumer Product Safety Act ("CPSA"), 15 U.S.C. § 2064, to failures to comply with the AFSL standards expressly relied upon by the CPSC.

As discussed in more detail below, we believe the combination of these steps, when implemented simultaneously, offers the best opportunity to maximize consumer safety.

CPSC and AFSL Progress Has Been Substantial But Incomplete

Working alongside one another, the CPSC and AFSL have made remarkable strides in improving the quality and safety of consumer fireworks. According to figures provided by the CPSC, at the time the CPSC implemented its own testing of imported fireworks in the late 1980s, approximately 76 percent of all tested shipments failed to meet the CPSC's fireworks regulations. As recently as 1994 – AFSL's first year of testing fireworks in China – CPSC data indicate that the rate of noncompliance with the CPSC regulations was still very high at 73 percent of tested shipments.

Ten years later, however, the overall noncompliance rate had shrunk dramatically to 28 percent of tested shipments, with much of the improvement attributable to AFSL's efforts to develop and promote its more detailed and stringent voluntary standards and certification program.² In 2005, only 17 percent of AFSL-certified shipments inspected by the CPSC were identified by the CPSC as not being in full compliance with the CPSC regulations. In contrast, nearly half of the inspected shipments that lacked AFSL certification failed to comply with the CPSC regulations. The impact of AFSL's standards and testing is even greater when comparing actionable violations of the CPSC's regulations – last year, the CPSC found only five percent of AFSL-certified shipments it inspected had an actionable violation of CPSC regulations, while 36 percent of the inspected shipments not certified by AFSL had actionable violations.³

AFSL's own test data reflect similarly dramatic improvements in the compliance level for the overwhelming majority of fireworks manufactured in China. In 1994, only 64 percent of all

² As part of its efforts to promote greater understanding and acceptance of its program within the fireworks industry, AFSL has been very active in reaching out to the Chinese fireworks manufacturers that produce the vast majority of the fireworks sold in the United States. Among other things, AFSL has translated its voluntary standards into Chinese and routinely provides continuing education programs to Chinese manufacturers about compliance with AFSL's standards.

³ This information was previously provided to AFSL by the CPSC's fireworks compliance staff.

Chinese fireworks tested by AFSL complied with both the CPSC's regulations and the AFSL's more stringent voluntary standards. By 2005, the rate of compliance with both sets of standards had risen to 90 percent of shipments by AFSL program participants. Graphs illustrating the growth of AFSL's certification program and the positive impact it has had on compliance rates are provided at Appendix 1.⁴

Similarly, the CPSC's data on injuries due to fireworks demonstrate a corresponding trend. Since 1994, the rate of fireworks-related injuries has declined by about a quarter from approximately 4.8 to 3.6 injuries per 100,000 people in 2005. At the same time, according to statistics tracked by the American Pyrotechnics Association ("APA"), annual consumption of fireworks has nearly tripled from 1994 levels.⁵ Thus, after factoring in consumers' increased exposure to fireworks in recent years (due to increased fireworks consumption), the actual risk of injury resulting from a given level of exposure to fireworks has decreased by a dramatic 75 percent over the past 11 years. Again, we believe that AFSL's voluntary standards and certification program have been instrumental in achieving that reduction in the injury rate.⁶

Nevertheless, despite the tremendous progress made to date, there still exists a persistent level of industry non-compliance with the CPSC regulations. As noted in the ANPR, after years of steady improvement, the overall rate of compliance with the CPSC regulations observed by the CPSC in its inspections of fireworks shipments leveled off between 2002 and 2004 at around 72 percent, and fell to 59 percent in 2005. As discussed above, these statistics almost certainly understate the actual compliance rate of the industry across all fireworks types, due to the manner in which the CPSC targets fireworks shipment lots for inspection (often targeting fireworks types with a greater chance of non-compliance).

Significantly, the compliance rate observed by the CPSC for products tested by AFSL has been consistently higher, averaging 81 percent from 2003 to 2005. This fact highlights the effectiveness of AFSL's certification program and strongly suggests that measures to improve the CPSC compliance rate will be most effective if geared toward promoting independent testing and certification of compliance with either the CPSC regulations or the AFSL standards.

⁴ The differences in the compliance rates measured by the CPSC and AFSL are attributable to differences in the datasets used to calculate the rates. Notably, the CPSC data is limited to the relatively small sample of fireworks shipments it tests (typically fewer than 400 lots per year). Moreover, many of the shipment lots selected for CPSC testing are chosen based on the prior compliance records of similar products (as a means of conserving CPSC resources while targeting higher risk products). On the other hand, AFSL's compliance data includes all types of fireworks and all of the shipment lots (nearly 30,000 per year) tested by AFSL. Thus, because the CPSC data does not reflect a representative sample of fireworks tested by AFSL, caution should be exercised in interpreting the compliance rates derived from the CPSC data.

⁵ The APA also estimates that the annual consumption-based rate of fireworks-related injuries has declined 90 percent since 1976 from 38 to 3.8 injuries per 100,000 pounds of fireworks. See Appendix 1 for more details.

⁶ As noted in the CPSC's 2005 Fireworks Annual Report, the standard errors associated with the CPSC's estimated injury rates make it difficult to compare the estimated injury rates across a period of years in order to identify trends in the data. However, when the substantial increase in fireworks consumption over the past several years is factored into the analysis, the downward trend in the risk of injury becomes statistically significant.

CPSC Action is Needed to Improve Fireworks Safety

Although the history of fireworks safety over the past 30 years is for the most part a tremendous success story, additional steps are needed to extend and solidify many of the safety standards and practices embraced now by a majority of industry participants. As discussed below, we believe the CPSC should pursue a comprehensive strategy that combines (a) mandatory certification by fireworks companies to the CPSC's existing fireworks regulations, (b) CPSC reliance upon AFSL's voluntary standards, and (c) mandatory reporting to the CPSC of noncompliance with specific AFSL standards expressly relied upon by the CPSC.

Each element of this integrated approach will help to achieve the goal of promoting greater fireworks safety, as follows:

- The proposed mandatory certification to the CPSC's regulations will promote greater compliance with the regulations, particularly among fireworks companies that do not currently participate in AFSL's certification program;
- CPSC reliance upon AFSL's voluntary standards will, in effect, elevate the minimum compliance threshold for some companies when combined with the reporting requirements in CPSA § 15(b); and
- The application of the CPSA § 15(b) reporting requirements to fireworks that fail to meet one or more of the relied upon AFSL standards will provide the CPSC with an effective tool to evaluate and hold accountable companies that fail to meet their fireworks safety obligations.

We believe this approach holds the best chance of further and materially lowering the noncompliance rate while simultaneously raising the safety standards applied to many fireworks companies. However, the ultimate success of this strategy depends heavily upon the implementation of all three elements simultaneously. Each of the three elements is described below.

Mandatory Certification is Needed to Address Limited, But Persistent, Noncompliance. The effectiveness of the CPSC's existing fireworks regulations is hampered by the absence of an efficient enforcement mechanism such as mandatory testing and certification. We believe the CPSC and the public would benefit significantly from the adoption of a new rule, under Section 10(a) of the Federal Hazardous Substances Act ("FHSA"), requiring all fireworks sold in the U.S. to be independently tested and certified for their compliance with the CPSC's existing fireworks regulations. Independent testing and certification of all consumer fireworks offers both greater certainty of compliance for companies and improved targeting of inspections and enforcement actions for the CPSC and U.S. Customs.

Please understand that we are not proposing a new CPSC certification program to replace AFSL's own certification program. Instead, we see both certification programs operating in concert – with the more stringent AFSL certification program enhancing and complementing the

CPSC's certification program. At the same time, due to AFSL's complete incorporation of the CPSC's regulations into its own voluntary standards, we would expect AFSL certification to be accepted by the CPSC in lieu of the proposed mandatory CPSC certification.

If this mandatory certification program is adopted by the CPSC with the proper internal controls and safeguards, we would expect markedly higher compliance rates from companies that are not currently participants in AFSL's program. In order to minimize the risk of fraud or inadequate service quality, we urge the Commission to set rigorous qualifications and procedures for any entities chosen to perform the necessary testing and certification services. We offer AFSL's own certification program as a model that the Commission may find helpful. Brief summaries of AFSL's testing and certification program are provided at Appendices 2 and 3.

Formal Reliance on AFSL's Voluntary Standards Would Enhance the CPSC's Existing Fireworks Regulations. The CPSC's existing fireworks regulations have remained relatively unchanged since their adoption more than 30 years ago. Over the intervening years, as fireworks technologies, products and markets have evolved, the CPSC's regulations have not kept pace with the safety issues presented by products on the market. To address this gap, AFSL has developed its own voluntary safety standards that incorporate and supplement the CPSC's regulations. As a result, AFSL's voluntary standards provide more stringent and detailed requirements and a higher level of consumer safety than currently found under the CPSC regulations.⁷

Furthermore, AFSL's Standards Committee recently completed an exhaustive review of AFSL's voluntary standards in order to update them and to identify and eliminate standards that were no longer deemed necessary.⁸ A copy of the newly revised AFSL standards is provided for your review at Appendix 4.

We strongly urge the Commission to rely formally upon AFSL's voluntary standards under the virtually identical provisions of FHSA § 3(g)(2), 15 U.S.C. § 1262(g)(2), and CPSA § 9(b)(2), 15 U.S.C. § 2058(b)(2). By doing so, the Commission would effectively bolster its existing regulations, improve compliance and increase consumer safety.

Under FHSA § 3(g)(2) and CPSA §§ 7(b)(1) and 9(b)(2), the CPSC is required to defer to a voluntary standard rather than issue a mandatory, ruled-based standard when:

⁷ One example of this is the inclusion in AFSL's voluntary standards of detailed provisions pertaining to the design and performance of multiple-tube aerial fireworks devices. The CPSC has effectively relied upon these AFSL standards in the absence of similarly detailed provisions in its own regulations. Other illustrative examples are provided in Appendix 5.

⁸ AFSL's Standards Committee is designed to facilitate participation in the standard-setting process by a broad cross-section of affected stakeholders while also drawing upon the deep knowledge of some of the leading technical experts in the field. The Standards Committee includes industry, government and consumer representatives, as well as representatives from the insurance industry and the fire services sector. Significantly, two representatives from the CPSC and one from the U.S. Department of Transportation also serve on AFSL's Standards Committee.

- the voluntary standard is likely to result in the elimination or adequate reduction of the risk of injury the CPSC seeks to address; and
- it is likely that there will be substantial compliance with the voluntary standard.

AFSL believes that the integrated approach proposed in this letter meets both of these tests required for CPSC reliance on a voluntary standard. Because AFSL's voluntary standards incorporate, and in many areas exceed, all of the requirements found in the existing CPSC fireworks regulations, CPSC reliance upon AFSL's voluntary standards can only enhance consumer safety protection. As described above, AFSL's successful track record in lowering the risk of injury and in promoting significantly higher compliance rates for products tested to the AFSL standards also provides strong and compelling evidence of the likely beneficial effect on consumer safety of CPSC reliance on the voluntary standards.

Furthermore, AFSL estimates that about 80 percent of the total annual volume of consumer fireworks imports are currently tested to AFSL's voluntary standards. When combined with the mandatory CPSA § 15(b) reporting requirements discussed below, CPSC reliance on AFSL's standards appears likely to cause more of the remaining twenty percent of imported fireworks to be tested to AFSL's standards.

Also, because consumer fireworks have historically been regulated by the CPSC under the Federal Hazardous Substances Act, we believe the Commission may need to reach a finding under CPSA § 30(d) that it is in the public interest to regulate the risk of injury posed by consumer fireworks in order to rely upon AFSL's voluntary standards under the CPSA. Given (a) the crucial role to be played by mandatory reporting in promoting industry adherence to the voluntary standards to be relied upon under this proposal, and (b) the absence of an adequate reporting requirement in the FHSA comparable to CPSA § 15(b), we believe the Commission can easily meet the public interest standard required by CPSA § 30(d).

Application of the CPSA Section 15 Reporting Requirements to AFSL's Standards Will Improve Compliance Accountability. Once the CPSC relies upon AFSL's voluntary standards under CPSA § 9(b)(2), we believe the Commission should apply the reporting requirements of CPSA § 15(b) (15 U.S.C. § 2064(b)) to those standards, as provided in 16 C.F.R. § 1115.5(b). CPSC reliance on AFSL's voluntary standards would, among other things, provide clearer parameters and incentives for fireworks companies that are not currently AFSL participants to certify their products to AFSL's voluntary standards. This will be particularly true if the companies are required to report the specific provisions of the AFSL standards that are not met, rather than just a general statement of noncompliance.

* * *

CPSC support of an industry-based, independent third party certification program as a means of obtaining compliance with its regulations has been and will continue to be essential to the success of the industry's efforts in this regard. Moreover, AFSL's ability to maintain standards addressing safety issues in the ever-changing fireworks industry; to objectively test

Mr. Todd Stevenson
September 11, 2006
Page 7

using independent, qualified personnel at the point of manufacture; and to act as a liaison between the CPSC and the industry, all serve to assist the CPSC effectively in its consumer safety role.

If the industry is to continue to succeed in addressing the safety of consumer fireworks, the CPSC must continue to demand full compliance with the fireworks regulations and thorough testing to verify that compliance. AFSL appreciates and supports the CPSC's efforts to enhance the safety of consumer fireworks through this rulemaking proceeding. If implemented in an integrated and simultaneous manner, we would expect our proposed approach to improve the level of product compliance, both quantitatively and qualitatively, while simultaneously strengthening the CPSC's ability to enforce the applicable regulations and safety standards.

We believe the Commission and consumers would benefit from even greater cooperation between AFSL and CPSC in their effort to promote fireworks safety. Together, our two organizations can continue to increase the safety of fireworks used by American consumers. AFSL greatly values the Commission's leadership and dedication to fireworks safety, and we stand ready to assist the CPSC in this area.

We thank you for your consideration of our comments.

Respectfully submitted,



John D. Rogers
Executive Director

cc: Christopher Smith, Esquire
Brett Crawford, Esquire

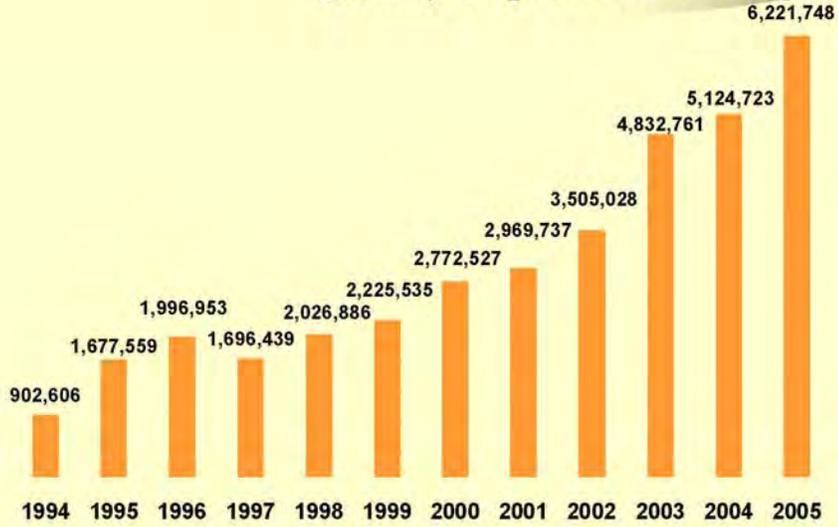
Enclosures

**Comments provided on September 11, 2006 by the
American Fireworks Standards Laboratory on the
Advance Notice of Proposed Rulemaking issued
by the CPSC on July 11, 2006**

APPENDIX 1

CASES TESTED BY YEAR 1994-2005

Quality Improvement Program



1

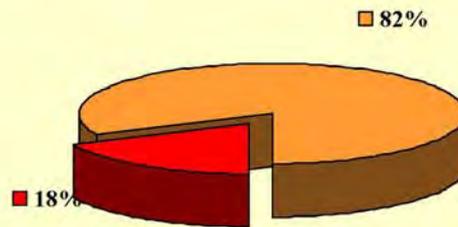
QIP Compliance Percentage By Year



2

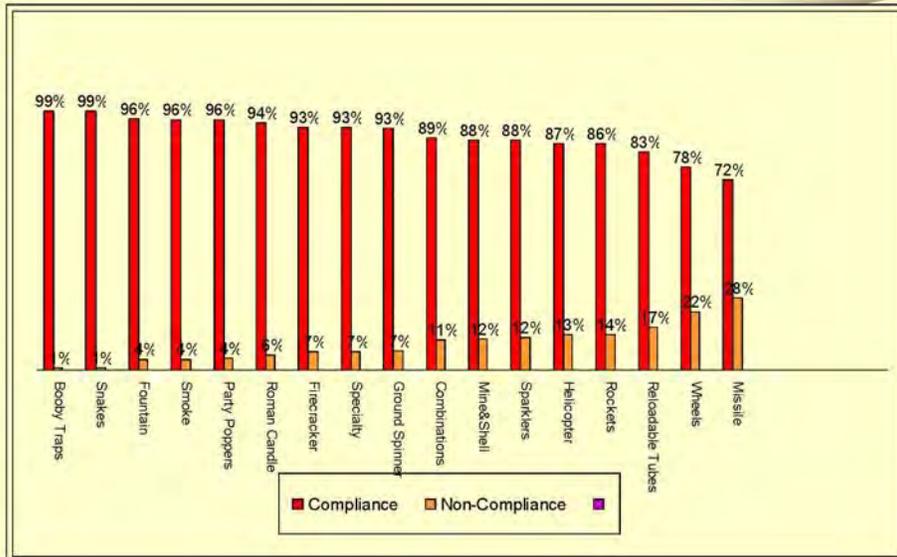
Regular and Assortment Testing, 2005

■ Regular ■ Assortment



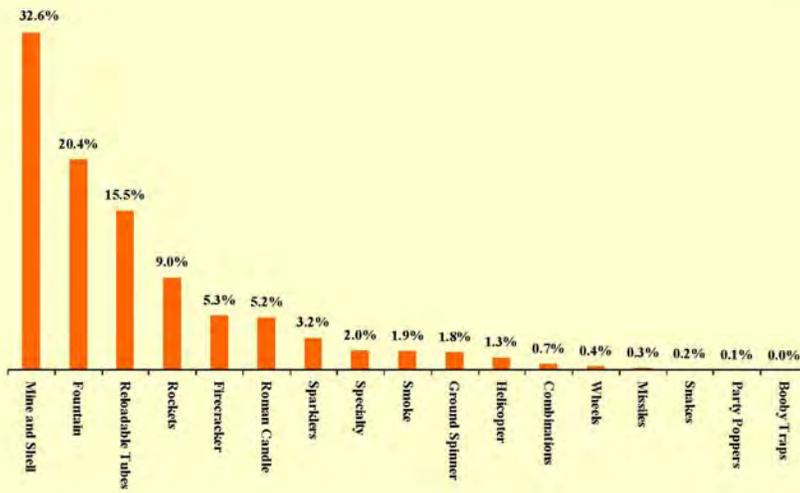
Grand Total Test Cases: 6,221,748
Regular Test Cases: 5,092,397
Assortment Test Cases: 1,129,351

Compliance Rate by Category for 2005



4

Percentage Testing by Product Category 2005



5

Comments from the National Fire Protection Association



National Fire Protection Association

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Phone: 617-770-3000 • Fax: 617-770-0700 • www.nfpa.org

September 7, 2006

Office of the Secretary
Consumer Product Safety Commission
Room 502
4330 East-West Highway
Bethesda, MD 20814

Re: Fireworks ANPR, Federal Register 71 FR 39249

Dear Mr. Secretary,

The National Fire Protection Association (NFPA) is pleased to have this opportunity to respond to your solicitation for comments to the queries presented in your advance notice of proposed rulemaking (ANPR) published in the Federal Register 71 FR 39249, July 12, 2006. **NFPA agrees with the ANPR that the number of injuries associated with consumer fireworks has been rising for several years. The level is high enough to pose an unreasonable risk to consumers.**

The first item in the ANPR asks for comments on the injury risks associated with consumer fireworks, with emphasis on the evidence presented in the ANPR. Each year NFPA prepares and publishes its annual Fireworks Report that details numbers and trends associated with fireworks-related injuries and deaths and structure and vehicle fires started by fireworks. This report reflects data within the National Fire Incident Reporting System (NFIRS) and National Electronic Injury Surveillance System (NEISS), the latter providing the same data cited in the ANPR. A copy of the full report is attached with these comments.

The 2006 report cites the 2004 CPSC NEISS data which showed there were 9,600 fireworks-related injuries treated in U.S. hospital emergency rooms. As noted in Section C. of this ANPR, the most recent CPSC data further substantiates the trend shown in fireworks-related injuries since 1996, which is up again in 2005 to 10,800 injuries.

As in most years, the majority of victims of fireworks injuries were under age 20.

Another fireworks-related risk not addressed by CPSC in this ANPR, but directly related to establishing the risk associated with fireworks use by consumers is the number of fires caused by fireworks each year. In 2003, an estimated 2,300 reported structure or vehicle fires were started by fireworks. These fires resulted in 5 reported civilian deaths, 60 civilian injuries, and \$58 million in direct property damage.

The risks of fireworks are typically encountered for only a few days each year. On the July 4th Independence Day holiday in a typical year, fireworks are the leading cause of reported fire, accounting for more outdoor fires in the U.S. than all other causes of outdoor fires combined.

Consumer fireworks have the highest estimated risk of fire death relative to exposure time of any product used in or around the home.

NFPA opposes all consumer fireworks use by the public.

NFPA has a long-standing position firmly against the dangerous practice of private (consumer) use of fireworks, which as noted, accounts for nearly all of the injuries from fireworks in most years. Many states still permit untrained citizens to purchase and use fireworks – objects that by their nature and design are intended to produce showers of hot sparks, or reach surface temperatures as high as 1200° F. The thousands of serious injuries and extensive property loss nearly all arise from this dangerous activity.

The increase in injuries cited by CPSC in this ANPR provides additional support and added urgency to our position advocating against the use of consumer fireworks. Since 1910, NFPA has maintained the position that fireworks are too dangerous to be used by consumers. We encourage the public to enjoy their fireworks at public fireworks displays put on by trained professionals.

In support of that position, the International Fire Marshals Association (IFMA) and NFPA prepare and publish the *Model Fireworks Law*, which prohibits possession, sale, or use of any fireworks, with some limited exceptions (copy attached to this submittal). The purpose of the law is to provide requirements in a form that is readily adoptable by both state and local jurisdictions.

The second item in this ANPR seeks input regarding the regulatory alternatives being considered and possible alternatives for addressing the risk. NFPA recommends that CPSC consider adopting the *Model Fireworks Law* as an alternative to the current regulations as a means for addressing the risk associated with fireworks use by the public.

The *Model Fireworks Law* was first adopted by the NFPA in 1938. Its basic philosophy is the restriction of the use of all fireworks, except toy paper or plastic caps, to authorized public displays, and these requirements have been incorporated into the laws of several states. The *Model Fireworks Law*, prepared by IFMA and published by NFPA, reflects NFPA's zero-tolerance policy for consumer use of fireworks. The *Model Fireworks Law* provides an alternative to the current regulatory approach in the wake of the multi-year upward trend in injuries sustained by individuals engaged in the use of legal consumer fireworks.

The *Model Fireworks Law* represents an existing standard that could be used immediately as a proposed regulation. NFPA offers the *Model Fireworks Law* in response to both the third and fourth items on which information and comment is sought.

Many responsible health and safety advocacy groups also oppose public access to fireworks.

In addition to NFPA, a wide range of safety and public health groups that include NFPA, the American Academy of Pediatrics, and the American Burn Association have concluded that the use of fireworks by consumers poses a major public health concern. Nonetheless public access to consumer fireworks has continued to increase. In fact, now only five states ban the use of all fireworks by individual consumers.

Most fireworks injuries are caused by consumer fireworks that are legal under current Federal law.

Five out of six emergency room fireworks injuries involved fireworks permitted by the Federal regulations for use by the consumer. Federal law permits public use of what are now referred to as "consumer fireworks" (formerly known as "common" or Class C fireworks) that comply with specific construction, chemical composition, and labeling regulations.

Some states further restrict the public's access to fireworks (only 5 states currently ban access by the public to all fireworks).

Six states allow only sparklers and/or novelties, while these common devices account for approximately one-third of the total injuries each year. This limitation on device type carries the label "safe and sane," and generally refers to sparklers, fountains, snakes, party poppers, and ground spinners. "Safe and sane" fireworks caused more injuries than illegal fireworks, especially to preschool children. In 2004, sparklers, fountains, and novelties alone accounted for two-fifths of fireworks injuries, including most injuries to pre-school children where the type of fireworks device was specified. In addition to the number of injuries, sparklers can also start very large fires.

The evidence in the ANPR does not support the claim that changes to the testing requirements or compliance rates will reduce the harm caused by consumer fireworks.

This ANPR does not establish a relationship between the compliance rate of tested fireworks and the number of injuries. No correlation has been shown by CPSC between the injury rate and whether the device complies with the testing requirements or practices. The fireworks involved in the injuries cited by CPSC and reported in the NFPA Fireworks Report are not identified or restricted to only devices tested or not tested by the AFSL test program. Furthermore, any examination of sample narratives from NEISS fireworks injuries will show all or nearly all injuries linked to user errors and not to product deficiencies. These narratives provide further evidence that the unacceptably high risk of injury to untrained, unlicensed consumers is inherent in the devices and the speed with which any error can translate into serious harm.

NFPA publishes standards for use by professionals in the distribution of consumer fireworks, but this standard does not imply that the risk of consumer use of those fireworks is manageable or acceptable.

The problem associated with the use of consumer fireworks includes fires in addition to the injuries. In response to requests from fire officials, NFPA has developed a new chapter in one of NFPA's pyrotechnics codes, NFPA 1124, *Code for the Manufacture, Transportation, Storage, and Retail Sales of Fireworks and Pyrotechnic Articles*, which provides minimum requirements for retail facilities that sell consumer fireworks. Our development of these requirements reflects the fact that in most parts of the country, retail sales are allowed but in no way shows a weakening of the resolve on the issue of whether they should be allowed. NFPA believes that fireworks are too inherently dangerous to be used by consumers and that retail sales of fireworks should be banned everywhere.

Consumer fireworks represent an unrecognized and uncontrolled point of vulnerability in homeland security.

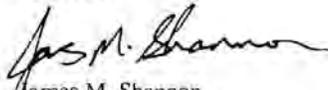
In this period of heightened awareness and protection of public safety in the name of homeland security, it is also important that any explosive commodity be carefully controlled so as not to become the source for a makeshift weapon or incendiary device. At the present time, consumer fireworks, which are classified as an Explosive, Class 1.4 G, usually are provided to the public without any controls on the qualifications of the consumer or their intent. As we have just witnessed with the recent attention to the potential for creating weapons from common substances involving liquids and off-the-shelf materials, it seems prudent that some controls be established for consumer fireworks.

The time is now to protect Americans from the unacceptably high and rising risk of injury from consumer fireworks.

The number of injuries suffered annually by the public from these legal devices and the extensive property loss caused by fires started by these devices demand that some action be taken to restrict and thus reduce the use by the untrained public.

We believe strongly that fireworks are too inherently dangerous to be used by consumers and that retail sales of fireworks should be banned everywhere. Focusing on testing requirements and compliance rates for existing Federal laws has not been an effective approach to reducing the annual toll from consumer fireworks. A new approach is necessary, namely, the adoption of the *Model Fireworks Law*. NFPA maintains its position and will continue to urge people to attend public displays organized and conducted by professionals and to not use fireworks themselves. By banning the use of consumer fireworks, we will prevent these needless deaths, injuries, and fires.

Sincerely,



James M. Shannon
President and CEO

Attachments: NFPA Fireworks Report, 2006
Model Fireworks Law, 2006

Comments from the International Fire Marshals Association

MODEL FIREWORKS LAW



2006 Edition

International Fire Marshals Association
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(617)984-7424 Fax: (617)984-7056

Model Fireworks Law 2006

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Secretary Charles "Ed" Altizer, State Fire Marshal, Virginia State Fire Marshals Office, Richmond, VA

Immediate Past President John F. Bender, Chief Fire Protection Engineer, Maryland State Fire Marshals Office, Pikesville, MD

Ken Crews, Fire Marshal, Durham Fire Department, Durham, NC

R. T. Leicht, Chief Fire Protection Specialist, Delaware State Fire Marshals Office, Wilmington, DE

David Lind, Fire Marshal, North Shore Fire Department, Bayside, WI

Steven Peavey, Deputy Fire Marshal, Altamonte Springs Building/Fire Safety, Altamonte Springs, FL

Executive Secretary Steven F. Sawyer, NFPA, Quincy, MA

Model Fireworks Law 2006 Edition

This edition of the *Model Fireworks Law* was prepared by the International Fire Marshals Association and published by NFPA. The NFPA Standards Council reviewed this model law at its October 2005 meeting for consistency with the policies of NFPA. This edition of the Model Fireworks Law supersedes all previous editions.

Origin and Development of the *Model Fireworks Law*

The National Fire Protection Association was among the pioneers who sought relief for the public from injuries and fires resulting from indiscriminate use of fireworks. Its efforts progressed from propagandizing during the early years of this century to a suggested municipal ordinance and then to a *Model State Fireworks Law*. The *Model State Fireworks Law* was first adopted by the NFPA in 1938. In 1949, the model law was amended to exclude from its provisions certain toy paper caps and devices for using them.

The *Model State Fireworks Law* found prompt acceptance in many states. Its basic philosophy, which is the restriction of the use of all fireworks, except toy paper or plastic caps, to authorized public displays, is incorporated in the laws of several states.

The *Model State Fireworks Law* was amended in 1972 and 1974. In 1978, its designation was changed from NFPA 494L to NFPA 1 121L. NFPA 1 121L was amended in 1982.

In 1988, the Board of Directors of the National Fire Protection Association transferred custody of the model law from the NFPA Committee on Pyrotechnics to the Fire Marshals Association of North America (now known as the International Fire Marshals Association). The model law was amended in 1991 to be readily adoptable by both state and local jurisdictions. Further changes include a provision that makes possession of fireworks by the general public illegal and violations of the law that result in a fire, personal injury, or death a felony offense.

The 2000 edition updated the law to reflect current fireworks classification, laws, and codes and standards.

The 2006 edition reaffirmed the 2000 edition.

**Model Fireworks Law
2006 Edition**

**BE IT ENACTED BY THE (GOVERNING BODY)
OF THE (JURISDICTION)**

1. No person, firm, or corporation shall possess, offer for sale, expose for sale, sell at retail, or use or explode any fireworks, except as herein provided.

2. Fireworks. Any composition or device for the purpose of producing a visible or an audible effect by combustion, deflagration, or detonation, and which meets the definition of "consumer (Explosive's 1.4G)", "theatrical and novelty (Explosives 1.4S)" or "display (Explosive's 1.3G)" fireworks as set forth in the U.S. Department of Transportation's (DOT) Hazardous Materials Regulation, Title 49, *Code of Federal Regulations (CFR)*, Parts 171-180.

Exception No. 1: Toy caps for use in toy pistols, toy canes, or toy guns, and trick noisemakers manufactured in accordance with DOT regulations, 49 CFR 173.100 (p),¹ and packed and shipped according to said regulations.

Exception No. 2: Model rockets and model rocket motors designed, sold, and used for the purpose of propelling recoverable aero models.

Exception No. 3: Propelling or expelling charges consisting of a mixture of sulfur, charcoal, saltpeter are not considered as designed to produce audible effects.

3. The authority having jurisdiction shall be permitted to adopt reasonable rules and regulations for the licensing of individuals or granting of permits for supervised displays of fireworks by municipalities, fair associations, amusement parks, and other organizations or groups of individuals. Such permits shall be permitted to be granted upon application to the authority having jurisdiction and approval in accordance with the regulations for the display and filing of a bond by the permit application. (*See NFPA 1123, Code for Fireworks Display and NFPA 1126, Standard for the Use of Pyrotechnics before a Proximate Audience.*)

4. Every such display shall be handled by a competent operator, licensed or certified as to competency by the authority having jurisdiction. Every such display shall be of such composition and character and shall be located, discharged, or fired so as, in the opinion of the authority having jurisdiction, after proper site inspection, not to be hazardous to any person or property. After such privileges have been granted, sales, possession, use, and distribution of fireworks for such displays shall be lawful for that purpose only. No permit granted hereunder shall be transferable.

5. Before any permit for a pyrotechnic display shall be issued, the person, firm, or corporation making application therefore shall furnish proof of financial responsibility to satisfy claims for damages to property or personal injuries arising out of any act or omission on the part of such person, firm, or corporation or any agent or employee thereof, in such amount, character, and form as this jurisdiction determines to be necessary for the protection of the public.

6. Nothing in this law shall be construed to prohibit any of the following:
- (a) The sale, at wholesale, of any fireworks for supervised displays by any approved resident manufacturer, wholesaler, dealer, or jobber, in accordance with regulations of the U.S. Bureau of Alcohol, Tobacco, and Firearms (*see Title 27, Code of Federal Regulations, Part 181*) and the U.S. Department of Transportation.
 - (b) The manufacture, transportation, or storage of fireworks at a manufacturing facility. The testing of fireworks under the direction of its manufacturer provided permission for such testing has been obtained from the authority having jurisdiction.
 - (c) The sale, transportation, handling, or use of industrial pyrotechnic devices or fireworks, such as railroad torpedoes, fuses, automotive, aeronautical, and marine flares and smoke signals.
 - (d) The sale and use of blank cartridges for use in a show or theater; for signal or ceremonial purposes; in athletics or sports; or legal power tools.
 - (e) The transportation, handling, or use of any pyrotechnic devices by the armed forces of the United States.
 - (f) The use of pyrotechnics in training by the fire service, law enforcement, or similar government agencies.
 - (g) The use of fireworks for agricultural purposes under the direct supervision of the U.S. Department of the Interior or an equivalent state or local agency. [*See Title 16, Code of Federal Regulations, Part 1500.17(a)(8).*]
7. The authority having jurisdiction shall seize, take, remove, or cause to be removed at the expense of the owner all stocks of fireworks offered or exposed for sale or stored or held in violation of the law.²
8. Any person, firm, or corporation violating the provisions of this law shall be guilty of a misdemeanor.
9. Any person, firm, or corporation violating the provisions of this law, which results in a fire, personal injury, or death, shall be guilty of a felony.
10. Any provisions of this law held to be unconstitutional shall not invalidate the remainder thereof. Any acts, laws, or parts of laws in conflict with any provision of this law are hereby repealed to the extent of the conflict.

¹ The regulations referred to limit the explosive content of each cap to not more than an average of 0.25 grains (16mg). Also, each package containing such caps must be labeled to indicate the maximum explosive content per cap.

² Where no provision in law already exists for the disposition of goods seized in violation of this law, appropriate provisions shall be enacted for the legal disposition of fireworks by the authority having jurisdiction following conviction for such violation.

Comments from the Pyrotechnics Guild International



Pyrotechnics Guild International, Inc.

TOM HANDEL
First Vice-President

September 10, 2006

Dear Sirs,

I am writing on behalf of the Board of Directors of the Pyrotechnics Guild International, Inc. (PGI) to respectfully request an extension to the public comment period concerning the CPSC's Advanced Notice of Proposed Rulemaking on proposed amendments to Fireworks Safety Standards in CFR 16 Parts 1500 and 1507. This comment period is presently scheduled to expire Monday September 11th, 2006.

The PGI is the largest hobbyist based pyrotechnics organization in the US and consists of some 3,800 members from all over the world. The current U.S. membership alone is more than 3,000. As you may well imagine, a coordination of a consensus opinion based on member input is not an easily or quickly obtained goal. We would be grateful for any deadline relief you can offer us in order that we may provide more comprehensive and useful input to the rulemaking process.

In the interim, I am providing below that which we presently have assembled as our basic comments.

- The Commission is considering whether there may be a need to update and strengthen its regulation of fireworks devices.

Comment:

The climate which exists between the Fireworks Hobby/Industry and the CPSC notwithstanding, the aim and the stated goals of the PGI have always been to provide our members and members of the general public with whatever training, advice and/or rules are required to encourage and maintain the utmost in safety concerning the acquisition, storage, transportation, handling and use of pyrotechnic materials.

In keeping with these goals, the PGI has developed and maintained what is arguably the best and most comprehensive Display Operator Certification Program available anywhere. This program is accepted in many states as

628 Harberts Court, Annapolis, MD 21401 Tel: 410-266-5276 E-mail: thandel@verizon.net

proof of competency and as an acceptable equivalent for obtaining state licensure as well.

Members of the PGI are instrumental in the drafting and in maintaining National Fire Protection Association Code pertaining to fireworks found in NFPA 1123, NFPA 1124 and NFPA 1126. These codes are fundamental to the fireworks industry, the hobbyist and regulatory and enforcement entities when it comes to ensuring safety in fireworks displays, stage/indoor displays, handling, storage use and disposal.

PGI has always been committed to these goals and in that respect we are in agreement with the CPSC on safety issues pertaining to our hobbyists and the public alike. The standards currently in place for consumer fireworks testing and approval, specifically testing standards developed by the American Fireworks Standards Laboratory in Bethesda, MD, are acceptable to the PGI. These standards, based on original CPSC standards were even made more stringent than the CPSC had originally requested.

Although we do feel the standards developed by the AFSL should be adopted, we do not feel that an award to a single laboratory is acceptable, fair to commerce or conducive to the integrity of the program itself. Rather, we would suggest that this testing procedure be administered by any and all such laboratory facilities or manufacturer's facilities equipped and deemed competent to administer tests and verify the results.

- The Commission is soliciting written comments concerning the risks of injury associated with fireworks that do not comply with the current fireworks device regulations, the regulatory options discussed in this notice, other possible ways to address these risks, and the economic impacts of the various regulatory alternatives.

Comment:

The PGI agrees that the introduction of devices which do not meet current standards into the marketplace should not be allowed. However, if there are such devices in the marketplace, it shows a lack of rigor or capacity in the testing and identification of these products during the quality and safety assurance stages of product introduction for which the CPSC has been responsible.

This would be a powerful argument to allow and enlist other qualified laboratory and testing facilities to join with the AFSL to handle the estimated 250+ million tons of product used in the US each year.

The Testing Standards, per AFSL Specification, if adhered to, would diminish if not altogether eliminate this deficiency and render the basic question moot for all intents and purposes.

Should any such devices appear on the marketplace, bypassing the testing/certification process, they by definition would be illegally manufactured and prohibited items and not regular "consumer products." These instances would continue to be an enforcement issue within the purview of the CPSC. With a broader base of testing facilities involved, however, the number of such instances should decline, and the enforcement burden on the Commission should be correspondingly diminished.

- The Commission also invites interested persons to submit an existing standard, or a statement of intent to modify or develop a voluntary standard, to address the risk.

Comment:

We embrace self-imposed safety standards already in place in both our hobby and in the industry at large and will do everything we can to teach people to follow these standards.

If further regulations are to be considered, we would request that they be mutually derived in a collaborative process between the regulatory agency and the regulated industry.

Thank you for the opportunity to provide these preliminary comments. We would be grateful for your favorable consideration of an extension to the comment period in order that we may provide further, more comprehensive and useful input.

Respectfully,

/s/

Thomas H. Handel

PGI Board of Directors

Bill Bahr, President
Tom Handel, Vice President
John Steinberg, 2nd Vice President
Kurt Medlin, Publications Vice President
Keith Midura, Secretary-Treasurer

Comments from the American Pyrotechnics Association (APA)

*File
APA
30*

**BEFORE THE
U.S. CONSUMER PRODUCT SAFETY COMMISSION**

**AMENDMENT TO FIREWORKS SAFETY STANDARDS
ADVANCE NOTICE OF PROPOSED RULEMAKING
REQUEST FOR COMMENTS AND INFORMATION**

**COMMENTS OF THE
AMERICAN PYROTECHNICS ASSOCIATION**

September 11, 2006

Julie L. Heckman
Executive Director
American Pyrotechnics Association
7910 Woodmont Avenue
Suite 1220
Bethesda, Maryland 20814

INTRODUCTION

By Federal Register Notice dated July 12, 2006, the CPSC announced an Advance Notice of Proposed Rulemaking on whether to update and strengthen its firework regulations. 71 Fed Reg. 39249 (2006). The Notice requested comments on the risks of injury associated with fireworks that do not comply with the current fireworks device regulations, comments on several options outlined further in the Notice and comments on other ways to address these risks, including tendering of existing standards such as the AFSL Standards. *Id.* Comments are due on or before September 11, 2006.

COMMENTOR

The American Pyrotechnics Association is the trade association of the fireworks industry. Its members include companies in the consumer, display and proximate pyrotechnics sectors of the industry. In the consumer fireworks sector, its members include U.S. importers and distributors of consumer fireworks, foreign manufacturers and exporters of consumer fireworks, various suppliers to the industry including carriers, brokers, transportation intermediaries, insurers, banking institutions, advertising specialty companies, etc. The APA has regularly appeared before the CPSC in every rulemaking involving consumer fireworks since the original rulemaking in 1976, which culminated in the promulgation of Part 1507. The APA appreciates this opportunity to submit comments in this proceeding.

POSITION OF COMMENTOR

At the out set, the APA wishes to challenge the CPSC with regard to its statement that, “during the past few years, there has been an increase in the estimated number of fireworks-related injuries”. The fireworks industry has experienced unprecedented growth, specifically during the past 5 years following the horrific events of September 11, 2001. Consumer fireworks useage has doubled during the past five (5) years alone and when one factors in the estimated number of injuries vs. consumption, the fireworks-related injury rate has never been lower in the 29 year history of CPSC regulation. Nonetheless, the APA is a strong supporter of continuing to do all that it can do to further reduce the rate of injuries associated with consumer fireworks, like commenting on this ANPR, and especially in promoting safety tips to consumers and reaching out to local officials, media and the public with regard to the importance of adhering to instructions for use.

The CPSC proposes four alternatives to reduce the identified risks associated with fireworks devices. 71 Fed. Reg. at 39250. The APA supports all four of the alternatives.

First, the CPSC proposes issuing a rule requiring mandatory testing of fireworks devices to the FHSA regulations currently in place (16 CFR Part 1507 and Part 1500.17 et seq). The APA supports this proposal. It would note that the APA already supports testing of

fireworks before they are shipped to the U.S. and/or when they arrive in the U.S. APA 87-1, Introduction at 1, and Testing Program at Appendix B. APA would also note such certification is also required by revised NFPA 1124, Section 6.2.7.1. APA would highlight that its members use many different testing companies and that it would be a restrictive practice to limit the testing to one testing company.

Second, the CPSC proposes issuing a rule requiring additional firework device requirements. The APA would note that both the APA 87-1 and the AFSL Standards are more detailed and cover more fireworks devices than Parts 1507 and 1500.

Third, the CPSC raises the issue of relying upon a tendered standard pursuant to 15 U.S.C. 1262(f)(6). The APA supports the CPSC relying upon APA 87-1 and/or the AFSL Standards and fully enforcing those standards. APA would note that APA 87-1 is already federal regulation by dint of incorporation in the PHMSA regulations at 49 CFR Part 173.57(j)(1).

Fourth, the CPSC raises the issue of taking enforcement action under Section 15 of the FHSA. The APA supports enforcement of the current FHSA standards and any relied upon standards under Section 15 of the FHSA.

CONCLUSION

Recognizing that we are at the beginning of a rulemaking, and these concepts will be fleshed out in the rulemaking process, APA reserves the right to submit additional comments later on. However, at this juncture, the APA fully supports the Advance Notice of Proposed Rulemaking.

Respectfully submitted,

American Pyrotechnics Association

Julie L. Heckman
Executive Director

Comments from various Fireworks Importers

15

Far East Imports, Inc.
5521 N Main
Joplin, MO 64801

CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION

2006 AUG 28 P 2:45

August 22, 2006

Office of the Secretary,
Consumer Product Safety Commission, Room 502
4330 East-West Highway
Bethesda, Maryland 20814

Re: Fireworks ANPR

Commissioners:

It has recently been brought to my attention that the CPSC is considering regulation changes concerning consumer fireworks. As you know, this is a field that is under constant scrutiny by State and local governing bodies, which have many agendas for their concerns. Most of these concerns are focused around property damage, which of course is driven by insurance companies. Your organization is the main protector of humans in this equation. CPSC regulations are designed to assure that the products manufactured or imported into the U.S. meet a level of composition and performance that provides protection for the consumer. The CPSC concerns are based more directly on bodily injury and to a lesser extent propriety damage. As an importer it is CPSC regulations that most effect the portion of the fireworks industry that involves my company.

When reading the ANPR on proposed changes I found options on the direction changes could take, but I could not find supporting reason for any change. I am a strong supporter of consumer safety and consumer protection. It pains me every time I hear of a personal injury due to the misuse of a firework, but in the same breath I realize that no activity can ever be completely safe when humans are involved. The APA shows that fireworks usage has soared in the past few years, but the personal injuries pre-capita of usage has declined. I think this fact alone indicates that the CPSC and its current regulations are doing a pretty good job.

As for testing, there are many testing facilities that provide comprehensive testing that meet regulations and on a voluntary basis exceed those regulations. The claim by AFSL that their guidelines are the ones that the industry has adopted is absurd. Like any industry the true driver of change is watching your competitor and then utilizing what they do better in your processes. Every tester out there has something they do that sets them apart from the rest in that specific procedure or process. The concept that we call "Best In Practices" in today's lingo.

In closing I would like to remind each commissioner that the injury statistics do not reflect some great void in the CPSC regulation or the manner that the fireworks industry is meeting the challenge of safe product development. If it did, I would be the first to write to tell you, but instead it shows that of the most injuries can be attributed to misuse in one way or another. We cannot stop people from making bad decisions (for whatever reason) that lead to injuries, but if there is a gain to be made, I feel that the consumer is the key.

I thank you for taking the time to review my comments and I hope that if nothing else I have given you proof that there are more voices out here than the voice of the AFSL.

Jake Marietta
President Far East Imports, Inc.

CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION

2006 AUG 31 A 10:43

August 20, 2006

10
Wild Bill's Fireworks
321 Valley Park Dr.
Branson, MO 65616

Office of the Secretary,
Consumer Product Safety Commission, Room 502
4330 East-West Highway
Bethesda, Maryland 20814

Re: Fireworks ANPR

To Whom It May Concern:

This is in response to the Fireworks ANPR posted by CPSC to the Federal Register on July 12, 2006. This would be a bad move for the fireworks industry. I encourage all efforts to maintain the safety and regulation of the fireworks industry, but why is this being considered? Having a self-serving organization control an entire industry is not in the best interests of all consumer fireworks retailers and wholesalers.

Since the founding of AFSL, only select companies have had a chance to be heard by the AFSL and its board. They run a club that is only worried about a select few companies and their own interests. I think it would be a mistake to give them the power to regulate the fireworks industry. The AFSL Board of Directors continually reflects the same ideas. Giving them this power may enable AFSL Board Members to use the standards as a tool to run off the competition.

I promote safety in our tents and stands. I support CPSC's desire to establish and enforce rules and regulations that will protect the consumer. I will also support CPSC's efforts to encourage a safer product for the consumer. I cannot, in any way, shape or form, condone the use of AFSL's standards being used as a government standard. Their stance on reloadable artillery shells is a perfect example. They are trying to kill a product that is safer than ones their own rules permit. This would be a mistake for the fireworks industry.

Should you have any questions, please feel free to contact me regarding this matter.

Best regards,



Noel Braun

Fireworks 11

CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION

2006 AUG 24 P 3 36

Fireworks Supercenter
107 Creek View Ct.
Weatherford, TX 76088

August 21, 2006

Office of the Secretary,
Consumer Product Safety Commission, Room 502
4330 East-West Highway
Bethesda, Maryland 20814

Re: Fireworks ANPR

To Whom It May Concern:

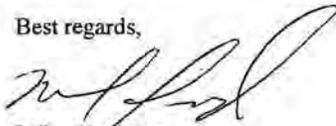
This is in response to the Fireworks ANPR posted by CPSC to the Federal Register on July 12, 2006. I am scared of what the ANPR is proposing. I support all efforts to ensure the safety and regulation of the fireworks industry, but I must question the logic of having a private organization controlling government regulation.

AFSL has been in existence for seventeen years and since the establishment of the organization, only select companies have had representation on the AFSL and its board. They run a club that is only worried about a select few companies. Having dealt with them on several issues, I think it would be a mistake to give them the power to regulate the fireworks industry. The AFSL Board of Directors continually reflects the same companies. Giving them this power may enable AFSL Board Members to use standards as a tool to more easily obtain their companies objectives and squash the competition.

I promote safety in our company's outlets. I respect CPSC's desire to establish and enforce rules and regulations that will protect the consumer. I have and will support CPSC's efforts to encourage a safer product for the consumer. I cannot, however, condone the use of AFSL's standards being used as a government standard. This would be a mistake for the fireworks industry.

Should you need anything, please feel free to contact me with any further questions or comments regarding this matter.

Best regards,



Mike Singletary
Fireworks Supercenter

12

Wholesale Fireworks Enterprises, LLC

1611 W. Ledgerwood Dr
Andover, KS 67002

CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION

August 21, 2006

2006 AUG 28 P 2:45

Office of the Secretary,
Consumer Product Safety Commission, Room 502
4330 East-West Highway
Bethesda, Maryland 20814

Re: Fireworks ANPR

Commissioners:

I am responding to the Advanced Notice of Proposed Rulemaking issued on July 12, 2006 concerning the updates and strengthening of fireworks regulations. As I am a strong advocate of consumer safety and protection, my primary concern is that any changes to these regulations are in direct pursuit of these goals.

It is the responsibility of the CPSC to research consumer safety issues, to evaluate and review the results of this research and to inevitably determine the proper regulatory actions in order to reach a reasonable level of protection for the consumer. Sounds simple enough when stated like that. Unfortunately, like most tasks in life, is not as easy as it sounds. The task requires a strong commitment, a sense of purpose and a clear focus on a well-defined goal that meets the objectives of the commission.

After reading through the ANPR, I had a very unsettling feeling that the commission charged with the task described above would allow itself to be steered into wholesale regulation changes. It further bothered me that this commission would allow a single entity that may or may-not represent a reasonable cross-section of the fireworks industry to gain such a foothold in the commissions direction. Where is the Commissions research and deliberation in the need for further regulation? In this document I see the words "According to AFSL" which indicates to me that the Commission is accepting the opinion of one group as the industry supported opinion without so much as verifying the roots of the source.

I am reminded of the small town whose city commission decided that a city manager was needed to relieve the day-to-day burden of city operation for the commissioners. Soon the city manager was making all the decisions for the town and the commissioners had become so out of touch with the workings of the city that their vote became a rubber stamp for the city managers whims.

If the commission decides that there are voids in the current body of regulations, if the commission decides that new regulations are needed to more fully protect consumers, then it must be the commission that leads this change. Please do not allow change to regulations for the sake of the appearance of accomplishment. Please do not allow the influence of a single group to be accepted as the desires of the entire industry.

Thank you for your time and please feel free to contact me if you wish.

Larry Hale
Operations Manager

Tab D



2010 Fireworks Annual Report

Fireworks-Related Deaths, Emergency Department-Treated Injuries, And Enforcement Activities During 2010

June 2011

Yongling Tu
Division of Hazard Analysis
Directorate for Epidemiology
U.S. Consumer Product Safety Commission

Demar V. Granados
Office of Compliance and Field Operations
U.S. Consumer Product Safety Commission

This analysis was prepared by CPSC staff. It has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

CPSC 6(b)(1) CLEARED for PUBLIC
6/20/11
NO MFRS PRVTL BLRS OR
PRODUCTS IDENTIFIED
— EXCEPTED BY: PETITION
RULEMAKING ADMIN. PRCDG
— WITH PORTIONS REMOVED: _____

Executive Summary

This report provides the results of the U.S. Consumer Product Safety Commission (CPSC) staff analysis of data on nonoccupational, fireworks-related deaths and injuries during 2010. The report also includes a summary of CPSC staff enforcement activities during 2010.

Staff obtained information on fireworks-related deaths from news clippings and other sources in the CPSC's Injury and Potential Injury Incident (IPII) database and the CPSC's Death Certificate File. Staff estimated fireworks-related injuries from the CPSC's National Electronic Injury Surveillance System (NEISS). More detailed analyses of injuries, including the type of injury, the fireworks involved, and the characteristics of the victim were based on a special study conducted by CPSC staff between June 18, 2010 and July 18, 2010. About 73 percent of the annual fireworks-related injuries for 2010 occurred during that period.

Highlights of the report are as follows:

- CPSC staff received reports of three fireworks-related deaths during 2010. In the first incident, a 22-year-old male died after he fell from a cliff when he detonated unspecified fireworks. In the second incident, a 49-year-old male perished when the fireworks he made illegally in his garage exploded. In the third incident, a 55-year-old male died in a house explosion caused by teenagers' mischievous use of Roman candles. CPSC staff has reports of two fireworks-related deaths in 2009. Reporting is not complete for either year, and the actual number of deaths may be higher.
- Fireworks were involved in an estimated 8,600 injuries treated in U.S. hospital emergency departments during calendar year 2010 (95 percent confidence interval 6,600–10,700). CPSC staff estimated that there were 8,800 fireworks-related injuries during 2009. The difference is not statistically significant.
- There is not a statistically significant trend in estimated emergency department-treated injuries from 1996, when estimated injuries were the lowest (7,300), to 2010.
- An estimated 6,300 fireworks-related injuries (or 73 percent of the total fireworks-related injuries) were treated in U.S. hospital emergency departments during the 1-month special study period between June 18, 2010 and July 18, 2010 (95 percent confidence interval 4,500–8,100). CPSC staff estimated that there were 5,900 fireworks-related injuries during the 2009 special study period.

Results from the special study include the following:

- Of the fireworks-related injuries sustained, 65 percent were to males, and 35 percent were to females.

- Injuries to children were a major component of total fireworks-related injuries, with children under 15 years of age accounting for approximately 40 percent of the estimated injuries. Fifty-three percent of the estimated emergency department-treated, fireworks-related injuries were individuals younger than 20 years of age.
- There were an estimated 900 injuries associated with firecrackers. Of these, an estimated 30 percent were associated with small firecrackers, 17 percent with illegal firecrackers, and 53 percent with unspecified firecrackers.
- There were an estimated 1,200 injuries associated with sparklers and 400 with bottle rockets.
- The parts of the body most often injured were hands and fingers (estimated 30 percent); legs (estimated 22 percent); eyes (estimated 21 percent); and head, face, and ears (estimated 16 percent).
- More than half of the injuries were burns. Burns were the most common injury to all parts of the body except the eyes, where contusions, lacerations, and foreign bodies in the eyes occurred more frequently.
- Most patients were treated at the emergency department and then released. An estimated 7 percent of patients were treated and transferred to another hospital or admitted to the hospital.

CPSC staff conducted telephone follow-up investigations of some fireworks-related injuries reported at NEISS hospital emergency departments during the special study period. Many of these cases were selected for follow-up because they involved potentially serious injuries and/or hospital admissions. Cases were also selected to clarify information in the hospital record about the incident scenario or fireworks type. Thirty-five telephone interviews were completed. After review, one of these incidents was determined to be out of scope because fireworks were not involved.

A review of data from telephone follow-up investigations of the 34 in-scope incidents showed that most injuries were associated with malfunctioning or misused fireworks. Typical malfunctions included fireworks exploding earlier or later than expected, errant flight paths, and the launching tubes of aerial shells tipping over. Misuse included fireworks set improperly or lit too close to other fireworks, and mischief. According to the investigations, most victims recovered from their injuries or were expected to recover completely; however, several victims reported that their injuries might be long term.

During 2010, CPSC's Office of Compliance and Field Operations continued to work closely with other federal agencies to conduct surveillance on imported fireworks

and enforce the provisions of the Federal Hazardous Substances Act (FHSA). Examples of these activities are as follows:

- CPSC established permanent staffing at the Import Safety Commercial Targeting and Analysis Center (CTAC) in Washington, D.C., and is working in cooperation with the Bureau of Customs and Border Protection (CBP) to implement new enforcement measures. In 2010, CPSC staff began implementing new procedures for identifying and selecting fireworks entries for examination and sampling and, with assistance from CBP, selectively sampled and tested numerous shipments of fireworks to determine if they were in compliance with the FHSA. From the pool of shipments targeted, approximately 43 percent contained noncompliant fireworks. CPSC staff requested corrective action on these noncompliant fireworks, and in most cases, firms destroyed the noncompliant fireworks voluntarily. Also, in June 2010, CPSC announced the recall of a violative fireworks device that had been sold to consumers.
- CPSC staff worked with other federal agencies, including the Bureau of Alcohol, Tobacco, Firearms and Explosives, the Department of Justice's Office of Consumer Litigation, as well as state and local law enforcement agencies. Staff provided legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers.

Recognizing the global economy, CPSC staff continues to work with our counterpart in China, the General Administration for Quality Supervision, Inspection and Quarantine (AQSIQ). AQSIQ and CPSC established four working groups on consumer products, one of which focuses on fireworks. According to 2010 statistics from the U.S. International Trade Commission, China manufactures more than 98 percent of all fireworks imported into the United States.

1. Introduction

This report describes injuries and deaths associated with fireworks during 2010. The report also describes CPSC staff enforcement activities for 2010. Reports for earlier years in this series can be found on the Internet at www.cpsc.gov/library/data.html

This report is organized into seven sections. Section 1 contains a description of the data and statistical methods used in this analysis. Section 2 summarizes fireworks incidents resulting in deaths. Section 3 provides an annual estimate of fireworks-related, emergency department-treated injuries for the United States in 2010, and compares that estimate with those for previous years. Section 4 analyzes emergency department-treated, fireworks-related injuries occurring during the month around the 4th of July. Section 5 summarizes the in-depth telephone investigations of a subsample of the injuries during that period. Section 6 describes enforcement activities of the CPSC's Office of Compliance and Field Operations during 2010. The main body of the report concludes

with a summary of the findings in Section 7. Appendix A presents a table on the relationship between fireworks-related injuries and fireworks imports between 1996 and 2010. Appendix B contains more detail on the completed telephone investigations.

Sources of Information

Information on nonwork-related fireworks deaths occurring during 2010 was obtained from the CPSC Injury and Potential Injury Incident file (IPII) and the CPSC's Death Certificate File. Entries in IPII come from sources such as newspaper articles, consumer complaints, lawyer referrals, medical examiners, and other government agencies. CPSC staff from the Office of Compliance and Field Operations conducted in-depth investigations of the deaths. The purpose of these investigations was to determine the types of fireworks involved and the circumstances that led to the fatal injuries.

Because IPII is based on voluntary reports and because it can take more than two years to receive all death certificates from the various states to complete the Death Certificate File, neither data source can be considered complete for the number of 2009 or 2010 fireworks-related deaths at the time this report was prepared. As a result, the number of deaths might be greater than the number reported here. Staff updates the number of deaths for previous years when reports are received. Total deaths for previous years may not coincide with the numbers in reports for earlier years because of such updates.

The source of information on emergency department-treated fireworks-related injuries is the National Electronic Injury Surveillance System (NEISS). NEISS is a probability sample of U.S. hospitals with emergency departments.¹ Injury information is taken from the emergency department record. This information includes the victim's age and sex, the place where the injury occurred, the emergency department diagnosis, the body part injured, and the consumer product(s) associated with the injury. The information is supplemented by a 160-character narrative that often contains a brief description of how the injury occurred.

To supplement the information available in the NEISS record, every year, during the month around the 4th of July, CPSC staff conducts a special study of fireworks-related injuries. In 2010, the special study period spanned June 18, 2010 to July 18, 2010. Staff focuses its efforts on fireworks during this period because in most years, about two-thirds to three quarters of the annual injuries occur then. During this period, hospital emergency department staff shows patients pictures of different types of fireworks to help them identify the type of fireworks device associated with their injuries. The type of fireworks involved in the incident is written in the NEISS narrative.

¹ For a description of NEISS, including the revised sampling frame, see Kessler and Schroeder (1998). Procedures used for variance and confidence interval calculations and adjustments for the sampling frame change in 1997 are found in Marker, Lo, Brick, and Davis (1999). SAS[®] statistical software for trend and confidence interval estimation is documented in Schroeder (2000). SAS[®] is a product of the SAS Institute, Inc., Cary, NC.

After reading the case records, including the narrative description of the fireworks device and the incident scenario, CPSC staff may assign cases for telephone investigations. Cases are usually selected because they involve the most serious injuries and/or hospital admissions. Serious injuries include eye injuries, finger and hand amputations, and head injuries. Cases also may be assigned to obtain more information about the incident than what is reported in the NEISS narrative. In most years, phone interviewers are able to collect information for one-third to one-half of the cases assigned. Information on the final status of the telephone interviews conducted during the 2010 special study is found in Section 5.

In the telephone investigations, information is requested directly from the victim (or the victim's parent, if the victim is a minor) about the type of fireworks involved, where the fireworks were obtained, how the injury occurred, and the medical treatment and prognosis. When the fireworks device reported is different from what is reported in the NEISS emergency department record, the device reported in the telephone investigation is used in the data for this report.

As a result of this process, there are three different levels of information that may be available about a fireworks-related injury case. For the cases that occur before or after the 4th of July special study period, the NEISS record is almost always the only source of information. Many NEISS records collected outside the special study period do not specify the type of fireworks involved in the incident. During the special study period, more information is available for analysis because the NEISS record usually contains the type of fireworks and additional details on the incident scenario. The most information is available for a subset of the special study cases with telephone investigations. These different levels of information about injuries correspond to different analyses in the report as follows:

- Estimated national annual fireworks-related injuries. This estimate is made using NEISS cases for the entire year, from records where fireworks were specified as one of the consumer products involved. For cases outside the special study period, as noted above, there is usually no information on the fireworks type and limited information on the incident scenario. Consequently, there is not enough information to determine the role played by the fireworks in the incident. This means that the annual injury estimate includes a small number of cases where the fireworks device was not lit or no attempt was made to light the device. Calculating the annual estimates without removing these cases makes the estimates comparable to previous years.²
- Detailed analyses of injury patterns. The tables in the report that describe fireworks type, body part injured, diagnosis, age, and sex of injured people, and other such information are based on the special study period only. Fireworks

² The only exception to the practice of including all of the cases occurred in 2003, where 9 cases representing an estimated 150 emergency department-treated injuries were excluded from the annual injury estimates. These cases resulted from the nightclub fire in West Warwick, RI, that also caused 100 deaths. For details see Greene and Joholske (2004).

types are taken from the telephone investigation or the NEISS comment field when there was no telephone investigation. When computing estimates for the special study period, staff does not include cases where the fireworks device was not lit or no attempt was made to light the device.

- Information from telephone investigations. Individual case injury descriptions and medical prognosis information from the telephone investigations are listed in Appendix B. These listings also exclude cases where the fireworks device was not lit or no attempt was made to light the device. These cases represent a sample of some of the most serious fireworks-related injuries and may not be representative of typical emergency department-treated, fireworks-related injuries.

Statistical Methods

Injuries reported by NEISS sample hospitals were weighted by the NEISS probability-based sampling weights to develop an estimate of total U.S. emergency department-treated, fireworks-related injuries for the year and for the special study month around the 4th of July. Confidence intervals were estimated, and other statistics were calculated using computer programs that were written to take into account the sampling design.³ Estimated injuries are rounded to the nearest 100 injuries. Estimates of fewer than 50 injuries are shown with an asterisk (*). Percentages are calculated from the rounded estimates. Percentages may not add to subtotals or to the total in the tables due to rounding.

The report also contains a number of detailed tables about fireworks-related injuries during the special study period. National estimates in these tables were also made using the sampling weights. To avoid cluttering the tables, confidence intervals are not included. Because the estimates are based on subsets of the data, they have larger relative sampling errors (*i.e.*, larger coefficients of variation) than the annual injury estimate or the special study month injury estimate. As a result, interpretation and comparison of these estimates with each other or with estimates from prior years should be made with caution. For example, when comparing subsets of the data—such as between injuries associated with two different types of fireworks or between two different age groups—it is difficult to determine how much of the difference between estimates is associated with sampling variability and how much is attributed to real differences in national injury totals.

2. Fireworks-Related Deaths for 2010

The CPSC has reports of three nonoccupational, fireworks-related deaths that occurred during 2010. Brief descriptions of the incidents are as follows:

³ See Schroeder (2000).

- A 22-year-old man from Colorado died when he fell approximately 100 feet off a cliff after he detonated unspecified fireworks. The victim stood near the edge of a cliff, lit a firework while he had another in his hand. The one in his hand ignited and he threw the firework. That was when he went missing. His body was later spotted and recovered.
- A 49-year-old male from Nebraska was fatally injured in an explosion when he illegally manufactured homemade fireworks in his garage. Materials and tools used in the illegal production of fireworks or explosives were recovered by the authorities at the scene.
- A 55-year-old male from Louisiana died in a house explosion caused by teenage mischief. The teenage boys were shooting roman candles at the victim's home, and one of the Roman candles ignited a curtain in the house. The fire caused an explosion in the house, leaving the victim unable to escape.

CPSC staff has reports of 74 fireworks-related deaths between 2000 and 2010, for an average of 6.7 deaths per year.⁴ According to the Centers for Disease Control and Prevention (CDC), there were 58 fireworks-related deaths (an average of 6.4 deaths annually) between 1999 and 2007.⁵ Unlike the statistics presented by CPSC staff, the CDC statistics include both work-related and nonwork-related fireworks deaths.

3. National Injury Estimates for 2010

Table 1 and Figure 1 present the estimated number of nonoccupational, fireworks-related injuries that were treated in U.S. hospital emergency departments between 1991 and 2010.

⁴ See previous reports in this series (e.g., the report for 2009: Greene, Tu and Granados (2010)). The number of deaths ranged from 11 deaths in 2007, to 7 deaths in 2008, and 2 deaths in 2009.

⁵ Data from CDC for ICD 10 code W39 (1999–2007). See <http://wonder.cdc.gov/cmfi-icd10.html>.

Table 1
Estimated Fireworks-Related Injuries 1991–2010

Year	Estimated Injuries	Injuries per 100,000 People
2010	8,600	2.8
2009	8,800	2.9
2008	7,000	2.3
2007	9,800	3.3
2006	9,200	3.1
2005	10,800	3.7
2004	9,600	3.3
2003	9,300	3.2
2002	8,800	3.1
2001	9,500	3.3
2000	11,000	3.9
1999	8,500	3.1
1998	8,500	3.1
1997	8,300	3.0
1996	7,300	2.7
1995	10,900	4.1
1994	12,500	4.8
1993	12,100	4.6
1992	12,500	4.9
1991	10,900	4.3

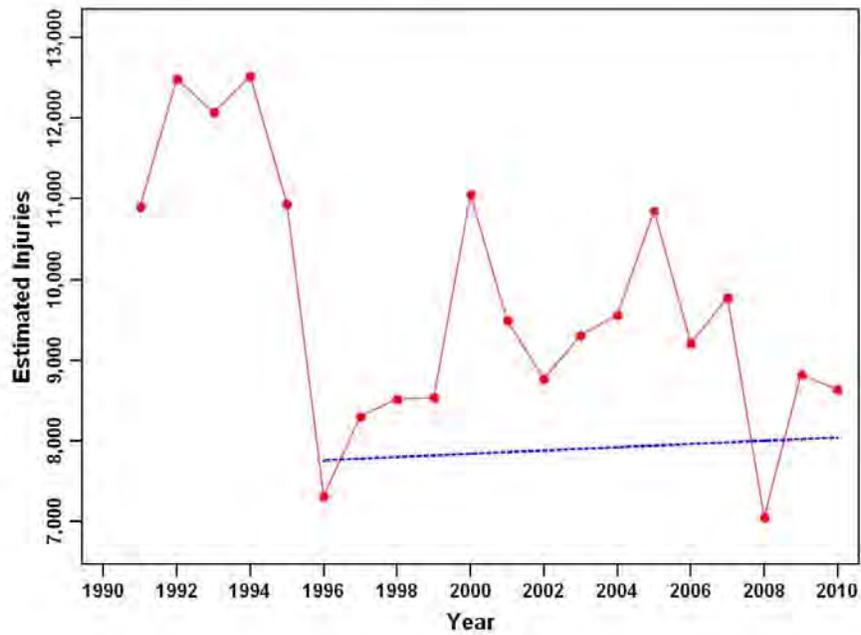
Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. The estimate for 2003 excludes an estimated 150 emergency department-treated injuries following the nightclub fire in West Warwick, RI. Estimates for 1991–1996 were revised to adjust for the changed sampling frame and do not match values published during that period. Population estimates for 2000 to 2010 from Table 1. Annual Estimates of the Resident Population by Sex and Five-Year Age Groups for the United States: April 1, 2000 to July 1, 2009 (NC-EST2009-01). Population Division, U.S. Census Bureau. <http://www.census.gov/popest/national/asrh/NC-EST2009-sa.html>. Estimates from earlier years at <http://www.census.gov/popest/archives/1990s/nat-total.txt>.

In calendar year 2010, there were an estimated 8,600 fireworks-related, emergency department-treated injuries (95 percent confidence interval 6,600–10,700). There were an estimated 8,800 injuries in 2009. The difference between the injury estimates for 2010 and 2009 was not statistically significant.

Figure 1 shows that the highest estimated numbers of annual injuries were between the years 1991 and 1995, followed by lower estimates between 1996 and 1999. Injuries rose to 11,000 in the millennium year (2000) and then decreased to 9,500 in 2001. Between 2002 and 2007, injuries fluctuated between 8,800 and 10,800. From the second lowest annual estimate of 7,300 in 1996, to the estimate of 9,800 in 2007, there

was a statistically significant upward trend. The regression equation from 1996 to 2010 also suggests an upward trend, but the slope is not statistically significant.⁶ The dashed line in Figure 1 (below) is the regression line estimated from the data between 1996 and 2010.

Figure 1
Estimated Fireworks-Related, Emergency Department-Treated Injuries
1991–2010



Appendix A contains a table showing estimated fireworks-related injuries and fireworks imports between 1996 and 2010.

⁶ For 1996 to 2010, the estimated regression slope was 20.32 injuries per year (standard error 61.85, $t=0.33$ at 13 df, $p = 0.374$ one tail). For details on the regression method that incorporates the sampling design, see Schroeder (2000) and Marker et al (1999).

4. Injury Estimates for the 2010 Special Study

The injury analysis in this section presents the results of the 2010 special study of fireworks-related injuries that were treated in hospital emergency departments between June 18, 2010 and July 18, 2010. During this period, there were an estimated 6,300 fireworks-related injuries (95 percent confidence interval 4,500–8,100), accounting for 73 percent of the total estimated fireworks-related injuries for the year.

The remainder of this section contains estimates for fireworks-related injuries from this period, broken down by different categories.

Fireworks Device Types and Estimated Injuries

Table 2 shows the estimated number and percent of emergency department-treated injuries by type of fireworks device during the special study period of June 18, 2010 to July 18, 2010.

Table 2
Estimated Fireworks-Related Injuries
By Type of Fireworks Device
June 18–July 18, 2010

Fireworks Device Type	Estimated Injuries	Percent
Total	6,300	100
All Firecrackers	900	14
Small	300	4
Illegal	200	2
Unspecified	500	7
All Rockets	400	6
Bottle Rockets	400	6
Other Rockets	100	1
All Other Devices	2,700	43
Sparklers	1,200	19
Fountains	200	3
Novelties	500	8
Multiple Tube	100	2
Reloadable Shells	500	8
Roman Candles	200	3
Homemade/Altered	*	*
Public Display	400	6
Unspecified	1,800	29

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. Based on 176 NEISS emergency department-reported injuries between June 18, 2010 and July 18, 2010, and supplemented by 34 completed In-Depth Investigations (IDI). Fireworks types are obtained from the IDI, when available; otherwise, fireworks types are identified from victim's reports to emergency department staff that was contained in the NEISS narrative. Illegal firecrackers include M-80s, M-500s, Quarter Sticks, and other firecrackers that are banned under the Federal Hazardous Substances Act (16 CFR § 1500.17). Fireworks that may be illegal under state and local regulations are not listed as illegal, unless they violate the FHSA. Subtotal estimates are presented below the firework type estimates. Estimates are rounded to nearest 100 injuries, and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (*).

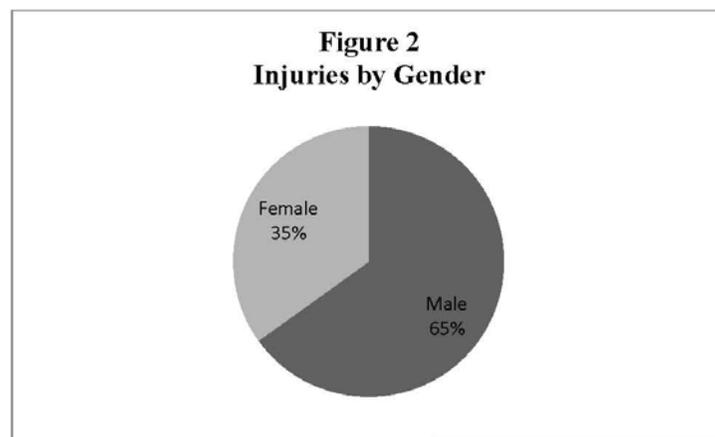
As shown in Table 2, firecrackers accounted for an estimated 900 emergency department-treated injuries, which was 14 percent of the total fireworks-related injuries during the special study period. Small firecrackers were involved in 300 injuries. The estimate for illegal firecracker-related injuries was 200; however, some of the estimated 500 unspecified firecracker-related injuries and some of the estimated 1,800 unspecified

fireworks-related injuries may have also involved illegal firecrackers. Also, sparklers accounted for an estimated 1,200 injuries, 19 percent of the total. Bottle rockets accounted for an estimated 400 injuries, 6 percent of the total.

Reloadable shells, novelty fireworks, fountains, multiple tube devices, public display fireworks, Roman candles, and homemade or altered devices each accounted for less than 10 percent of the injuries. This is in keeping with previous years. While these devices are not associated with a large number of injuries, the larger load in these devices makes them involved disproportionately in serious injuries and deaths.

Gender and Age of Injured Persons

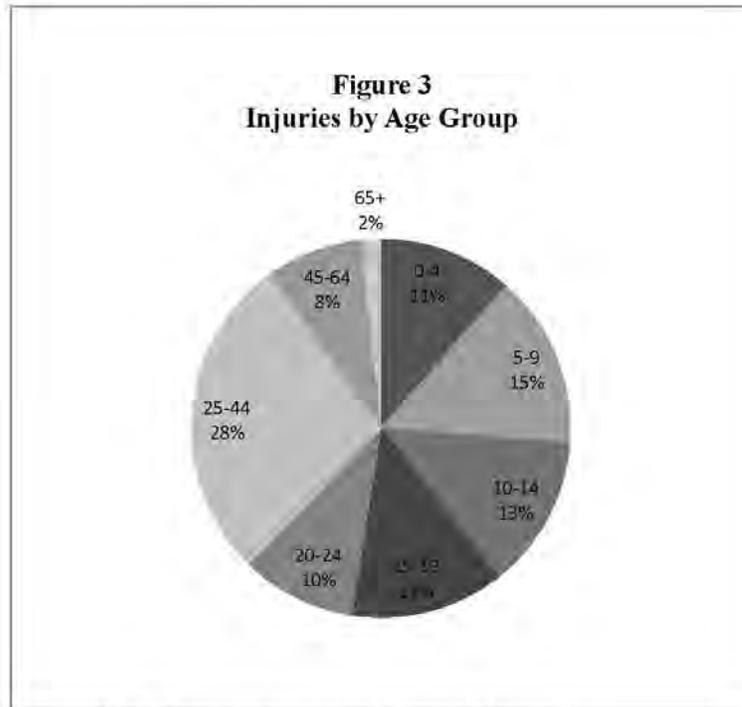
Males had 4,100 fireworks-related injuries, representing 65 percent of the total injuries. Males experienced 2.7 fireworks-related, emergency department-treated injuries per 100,000 individuals during the special study period. Females, with 2,200 emergency department-treated injuries, had 1.4 injuries per 100,000 people. The concentration of injuries among males and people under 25 has been typical of fireworks-related injuries for many years. Figure 2 shows the distribution of fireworks-related injuries by gender.



Note: Percentages are computed from rounded estimates.

Children under 5 years old experienced an estimated 700 injuries (11 percent of all fireworks-related injuries during the special study period) as shown in Figure 3 and Table 3. Children in the 5- to 14-year age group experienced an estimated 1,800 injuries (29 percent of all fireworks-related injuries). Breaking that age group down further, children 5 to 9 years old had 900 injuries, and children 10 to 14 years old had 800 injuries. In the aggregate, children under 15 years old accounted for approximately 40 percent of

the fireworks-related injuries. Children and young adults under age 20 constituted 54 percent of the fireworks-related injuries.



Note: Percentages are computed from rounded estimates.

The detailed breakdown by age and gender is shown in Table 3.

Table 3
Estimated Fireworks-Related Injuries
By Age and Sex
June 18–July 18, 2010

Age Group	Total	Per 100,000 People	Male	Female
Total	6,300	2.1	4,100	2,200
0–4	700	3.3	400	300
5–14	1,800	4.4	1,100	700
5–9	900	4.4	600	300
10–14	800	4.0	500	300
15–24	1,400	3.2	1,100	300
15–19	800	3.7	600	200
20–24	600	2.8	500	100
25–44	1,700	2.0	1,100	600
45–64	600	0.8	300	300
65 +	100	0.3	100	*

Sources: NEISS, U.S. Consumer Product Safety Commission/EPHA, U.S. population from <http://www.census.gov/popest/national/asrh/NC-EST2009-sa.html>. The oldest victim was 65 years old. Estimates are rounded to nearest 100 injuries, and percentages are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (*).

When considering per capita injury rates, children 5 to 9 years old had the highest per capita injury rate at 4.4 injuries per 100,000 population. This was followed by children ages 10 to 14 years old at 4.0 per 100,000, and children ages 15 to 19 years old at 3.7 injuries per 100,000 people.

Age and Gender of the Injured Person by Type of Fireworks Device

Table 4 shows the ages of those injured by the type of fireworks device associated with the injury. For children under 5 years old, sparklers accounted for the largest number of estimated injuries at 300 injuries, which was 43 percent of the total injuries in that age group. Children 5 to 14 years old had an estimated 400 injuries from sparklers.

No clear relationship between age and fireworks type is suggested in Table 4. It is worth noting that the number of injuries does not completely represent usage patterns because victims are often injured by fireworks used by other people. This is especially true for rockets and aerial shells (*e.g.*, fountains and multiple tube and reloadable devices) that can injure people located some distance away from where the fireworks are launched.

Table 4
Estimated Fireworks-Related Injuries
By Device Type and Age Group
June 18–July 18, 2010

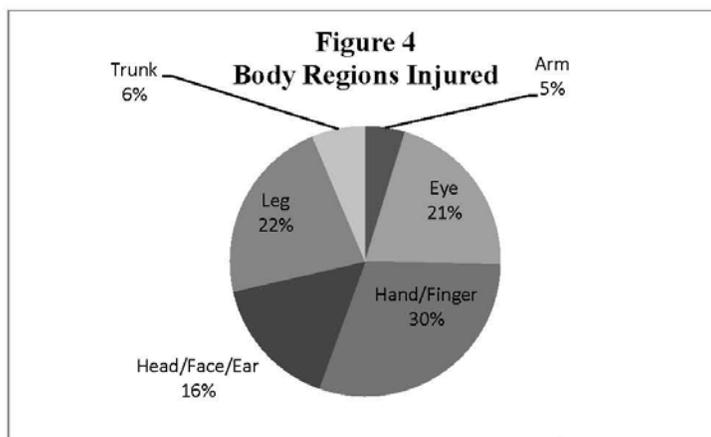
Fireworks Type	Total	Age Group					
		0–4	5–14	15–24	25–44	45–64	65+
Total	6,300	700	1,800	1,400	1,700	600	100
All Firecrackers	900	*	100	200	400	*	*
Small	300	*	100	100	100	*	*
Illegal	200	*	*	*	100	*	*
Unspecified	500	*	*	200	200	*	*
All Rockets	400	100	100	200	*	100	*
Bottle Rockets	400	100	*	200	*	100	*
Other Rockets	100	*	*	*	*	*	*
Other Devices	2,700	400	800	500	800	200	*
Sparklers	1,200	300	400	200	200	100	*
Fountains	200	*	100	*	100	*	*
Novelties	500	100	200	100	100	*	*
Multiple Tube	100	*	*	*	100	*	*
Reloadable	500	*	*	200	200	*	*
Roman Candles	200	*	*	*	200	*	*
Homemade/Altered	*	*	*	*	*	*	*
Public Display	400	100	*	100	200	100	*
Unspecified	1,800	200	800	400	300	200	100

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. Estimates are rounded to nearest 100 injuries, and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (*).

As mentioned previously, males experienced 65 percent of the fireworks-related injuries, and females accounted for 35 percent. Males were associated with all the estimated injuries from fountains and most of the estimated injuries from bottle rockets, novelty devices, and reloadable shells. Females experienced more injuries than males in incidents at public fireworks displays.

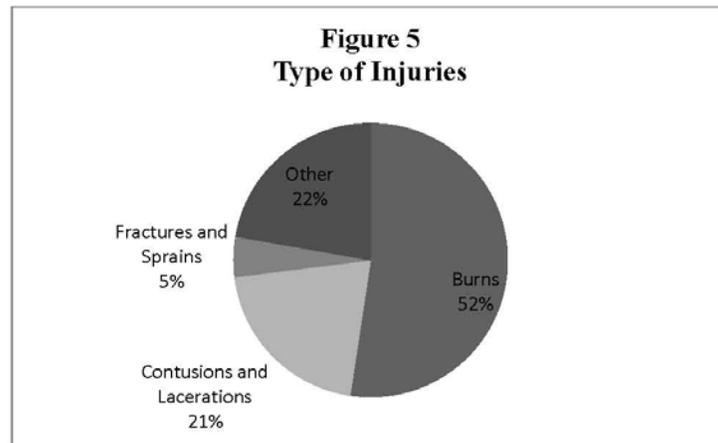
Body Region Injured and Injury Diagnosis

Figure 4 presents the distribution of estimated emergency department-treated injuries by specific parts of the body where the injury occurred. Hands and fingers, with an estimated 1,900 injuries, accounted for 30 percent of the total injuries. These were followed by an estimated 1,400 leg injuries, accounting for 22 percent; 1,300 eye injuries, accounting for 21 percent; and 1,000 injuries to the head/face/ear region (16 percent). The remaining 11 percent of the injuries were to the arm or trunk.



Note: Percentages are computed from rounded estimates.

Figure 5 shows the types of injuries. Burns, with 3,300 estimated injuries (52 percent) was the most frequent injury diagnosis. Contusions and lacerations were associated with 1,300 injuries (21 percent), and fractures and sprains were involved in 300 injuries (5 percent). The remaining 1,400 estimated injuries (22 percent) were attributed to other diagnoses.



Note: Percentages are computed from rounded estimates.

The most frequent injuries to hands, fingers, legs, and arms were burns. Also, nearly half of the injuries to the head and face were burns. Most eye injuries were contusions, lacerations, and other diagnoses that included foreign bodies in the eye. This detail is shown in Table 5.

Table 5
 Estimated Fireworks-Related Injuries
 By Body Region and Diagnosis
 June 18–July 18, 2010

Body Region	Total	Burns	Diagnosis		Other Diagnoses
			Contusions Lacerations	Fractures Sprains	
Total	6,300	3,300	1,300	300	1,400
Arm	300	300	*	*	*
Eye	1,300	300	500	*	600
Hand/Finger	1,900	1,300	300	*	100
Head/Face/Ear	1,000	500	400	*	200
Leg	1,400	800	100	300	300
Trunk/Other	400	100	*	*	200

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. Fractures and sprains also include dislocations. Other diagnoses include all other injury categories. Arm and shoulder region includes NEISS codes for upper arm, elbow, lower arm, shoulder, and wrist. Head/Face/Ear regions include eyelid, eye area, nose, neck, and mouth but not the eyeball. Leg includes upper leg, knee, lower leg, ankle, foot, and toe. Trunk/other region includes chest, abdomen, pubic region, all parts of body, internal, and 25–50 percent of body. Estimates are rounded to nearest 100 injuries, and percents are computed from the rounded estimates. Percentages may not add to subtotals or the total due to rounding. Estimates of less than 50 injuries are denoted with an asterisk (*).

Type of Fireworks Device and Body Region Injured

Table 6 presents estimated injuries by the type of fireworks device and body region.

Table 6
 Estimated Fireworks-Related Injuries
 By Type of Fireworks Device and Body Region
 June 18–July 18, 2010

Fireworks Type	Total	Region of the Body					
		Arm	Eye	Head/Face	Hands/Fingers	Leg	Trunk/Other
Total	6,300	300	1,300	1,000	1,900	1,400	400
All Firecrackers	900	100	100	200	300	200	*
Small	300	*	*	100	100	100	*
Illegal	200	*	*	*	100	100	*
Unspecified	500	100	100	100	100	100	*
All Rockets	400	*	200	*	200	*	*
Bottle Rockets	400	*	200	*	200	*	*
Other Rockets	100	*	*	*	*	*	*
Other Devices	2,700	100	400	300	1,200	600	100
Sparklers	1,200	*	200	100	500	300	100
Fountains	200	100	100	100	*	*	*
Novelties	500	*	*	*	300	200	*
Multiple Tube	100	*	*	*	100	*	*
Reloadable	500	*	*	*	300	100	*
Roman Candles	200	*	100	100	*	*	*
Homemade/Altered	*	*	*	*	*	*	*
Public Display	400	100	200	*	*	100	100
Unspecified	1,800	*	500	500	200	400	100

Source: NEISS, U.S. Consumer Product Safety Commission/EPHA. See notes for Table 2 and Table 5.

About 42 percent of the estimated sparkler injuries involved the hands and fingers. Fireworks devices that fly or emit sparks were associated with eye, head, and face injuries. These included fountains, novelties, public display fireworks, and sparklers.

Hospital Treatment

An estimated 92 percent of the victims of fireworks-related injuries were treated at the emergency department and then released; about 3 percent of victims were treated and transferred to another hospital; approximately 4 percent were admitted to the

hospital; and the remaining 1 percent of victims left without being seen. The treat and release percentage was about the same for all consumer products in 2010.⁷

5. Telephone Investigations of Fireworks-Related Injuries

CPSC staff conducted telephone investigations of some fireworks injuries that occurred during the 1-month special study period surrounding the July 4th holiday (June 18, 2010 to July 18, 2010). Completed telephone investigations provided more detail about incidents and injuries than the emergency department information summarized in the narrative in the NEISS record. During the telephone interview, respondents were asked how the injury occurred (hazard pattern), their medical care following the emergency department treatment, and the long-term effects, if any, from their injury. Respondents were also asked detailed questions about the fireworks, including its type, markings, and where it was obtained.

Cases were selected for telephone investigations based on the information provided in the NEISS narrative and coded information in the NEISS records. The selection criteria included: (1) unusual hazard patterns, (2) severity of the injury, and (3) lack of clear information in the narrative about the type of fireworks associated with the injury. For these reasons, and because many victims did not respond, these telephone investigation cases cannot be considered typical of fireworks-related injuries.

From the 177 emergency department-treated, fireworks-related injuries during the special study period, staff selected 69 cases for telephone investigations, of which 34 were completed and determined to be in scope, and one was completed and found to be out of scope. Table 7 shows the final status of these investigations.

⁷For all injuries in 2010, 92 percent of patients were treated and released; 1 percent was transferred to other hospitals; 5 percent were admitted to the hospital; and slightly more than 1 percent had other dispositions, including left hospital without being seen, held for observation, or dead on arrival.

Table 7
Final Status of Telephone Investigations

Final Case Status	Number of Cases	Percent
Total Assigned	69	100
Completed Investigation	35	51
In-scope	34	49
Out-of-scope	1	1
Incomplete Investigations	34	49
Failed to Reach Patient	15	22
Victim Name Not Provided by Hospital	14	20
Victim Refused to Cooperate	5	7

Note: Percentages may not add to subtotals or the total due to rounding.

One case was found to be out of scope after receiving information in the telephone investigation that indicated that fireworks were not involved in the incident. Short descriptions of the remaining 34 completed cases are found in Appendix B. The cases are organized in order of emergency department dispositions, with Admitted (to the hospital) first, followed by Treated and Released. Within dispositions, cases are in order of increasing age of the victim.

Summary Statistics

Of the 34 completed cases, 27 (79 percent) involved males, and seven (21 percent) involved females. There were 5 victims (15 percent) age 0 to 4 years old; 10 victims (29 percent) age 5 to 14 years old; 7 victims (21 percent) age 15 to 24 years old; 9 victims (26 percent) age 25 to 44 years old; and 3 victims (9 percent) age 45 to 64 years old. With respect to emergency department dispositions, 9 victims (26 percent) were admitted to the hospital, and 25 (74 percent) were treated and released.

The most frequently used fireworks devices in these incidents were aerial shells⁸ and unspecified devices, each accounted for 7 incidents (21 percent); followed by sparklers with 6 incidents (18 percent). Four cases (12 percent) were associated with rockets (3 with bottle rockets and 1 with unspecified rocket). Also, firecrackers were involved in 4 incidents (12 percent), one was related to large firecrackers, and the other 3 were related to firecrackers with unspecified size. Novelty devices (*e.g.*, smoke bombs)

⁸ The category "aerial shells" includes multiple tube, reloadable mortars and rockets, but excludes bottle rockets.

were associated with 3 incidents (9 percent). Fountains were involved in 2 incidents (6 percent) and homemade devices were associated with 1 incident (3 percent).

Note that the distribution of the types of fireworks and the emergency department dispositions differ from the special study data in Section 4. These differences reflect the focus in the telephone investigation on more serious injuries and incompletely specified NEISS records. Note also that only half of the victims selected for the telephone investigations responded.

Hazard Patterns

The hazard patterns described below are based on the incident descriptions obtained during the telephone investigations and summarized in Appendix B. When an incident has two or more hazard patterns, the hazard pattern most likely to have caused the injury was selected. Hazard patterns are presented in Table 8, below.

Table 8
Hazard Patterns in Telephone Investigations of Fireworks-Related Injuries

Hazard Pattern	Number of Cases	Percent
All	34	100
Misuse	10	29
Holding Fireworks in Hand	3	9
Mischief	2	6
Fireworks Not Set Properly	2	6
Lighting Fireworks Near Explosive	1	3
Fireworks Wrapped Together	1	3
Other Misuse	1	3
Malfunction	21	62
Debris, Smoke	9	26
Errant Flight Path	5	15
Early or Late Ignition	4	12
Tipover	3	9
Other	3	9

Note: Percentages may not add to subtotals or the total due to rounding.

Misuse (10 victims injured, 29 percent)

Ten victims were injured when fireworks were used in ways that depart from typical usage.

Holding Fireworks in Hand. In Case 1, an 11-year-old male found an unused golf ball-shaped firework on the beach. He held the firework in his right hand and lit it. The firework exploded in his hand, and he was injured. In Case 9, a 42-year-old male set off smoke bombs to get rid of bugs, and one of the smoke bombs blew up in his hand. He was injured seriously. In Case 13, the victim's older brother lit an unspecified firework, and the 3-year-old male victim grabbed the firework and held it in his hand before his brother could throw it away. The firework exploded in the victim's hand and injured him.

Mischief. Two victims were injured as a result of mischievous acts by others. In Case 21, when a 12-year-old female and her family were getting out of their car on the driveway, her neighbor deliberately threw a string of fireworks at them. The popping sound frightened the victim, and she hit her head against the car door when she jumped backwards. In Case 23, a 16-year-old male was injured when another child threw a firework under his chair at school. The victim was scared by the loud noise from the firework and hit his head against the wall.

Fireworks Not Being Set Properly. In Case 15, a 6-year-old female and her stepsister placed a bottle rocket in a cone improperly. When they lit it, the rocket shot into the victim's lip and hurt her. In Case 22, a 12-year-old male did not fully unwrap the fuse of a fountain firework. As a result, the fuse was too short, and the firework exploded near his face and injured his eye.

Lighting Fireworks Near Explosive. In Case 8, a 41-year-old male lit sparklers just a few feet away from an open cooler, which contained flash powder. A sparkler landed in the cooler and caught the flash powder on fire. The victim's leg was on the cooler, and he sustained burns from his right foot up to his forearm.

Fireworks Wrapped Together. In Case 5, a 26-year-old male made a sparkler bomb by wrapping a number of sparklers with duct tape. He lit the sparkler bomb, and it exploded before he could move away. He was injured in several places.

Other Misuse. In Case 19, a 7-year-old boy was running around with a sparkler in his hand and waving it. The sparkler slipped into his hand and burned his palm.

Malfunction (21 victims injured, 62 percent)

Twenty-one victims were injured when fireworks reportedly malfunctioned. These injuries included debris and smoke with 9 injuries, errant flight paths with 5 injuries, early or late ignitions with 4 injuries, and tipovers with 3 injuries. Note that

some of the errant flight path injuries may have involved tipovers, but victims may have been unable to observe the tipover if they were far from the fireworks.

Debris and Smoke. In Case 2, a 14-year-old male and his friends were lighting fireworks in the street. He was injured when a rocket, ignited by someone else, went sideways, and a spark from it lit his pants, and they caught on fire. In Case 3, a 19-year-old male was injured by debris from a smoke bomb set off by his father. He was standing next to his father, and the debris lodged in his leg. In Case 10, a 2-month-old baby girl was carried by her mom to their car in a car seat. Some debris or sparks from fireworks landed on her car seat, and the material of the car seat burned. The victim was injured on her lower leg. In Case 11, a 5-month-old baby girl was held by her aunt on a porch. A boy came down the street throwing some fireworks. The victim started crying, and her aunt felt that she may have been hit in the eye by one of the sparks. In Case 12, a 3-year-old boy was given a used sparkler that was still hot. He attempted to throw the sparkler, but it went down his shirt. He suffered burns to his chest. In Case 14, a 4-year-old boy's father lit some smoke bombs that shot off colored smoke. The victim ran into the smoke and leaned over to a smoke bomb on the ground. The tar that held the wick was still "sizzling," and a small piece of tar shot into his eye and injured him. In Case 16, someone lit a firecracker, leaving sparks on the ground. A 6-year-old female did not see the sparks and stepped on them; the bottom of her right foot was burned. In Case 18, a 7-year-old boy was watching his neighbor set off fireworks. His neighbor held an aerial fountain in his hand and lit it. The firework ignited so fast that the neighbor dropped it; the firework went sideways, and the sparks hit the victim and injured him. In Case 24, a 17-year-old male and his friends were standing by an open car door to block the wind so they could light sparklers. A spark flew into the back seat of the car and ignited a blanket. The victim grabbed the blanket and got thermal burns to his right hand.

Errant Flight Path. In Case 4, a 22-year-old male was about 12 feet away from where a bottle rocket was ignited. His friend held the rocket in his hand and then dropped it on the ground. The rocket skipped across the lawn and went into the victim's eye and injured him. In Case 7, a 40-year-old female was 7 or 8 feet away from where aerial shells were setting off. One of the fireworks fell out the tube, went sideways, and hit her in the chest. In Case 26, a 20-year-old male was in his backyard when a neighbor ignited aerial shells about 25 feet away from him. The last shell went sideways through a cardboard box and injured him. In Case 31, a 40-year-old male was in his backyard. One firecracker (size unspecified) set off by his neighbor ran sideways, and a piece of metal from the firework stuck in his ankle. In Case 34, a 63-year-old male was 50 feet away from where fireworks were set off by a neighbor. His neighbor ignited a mortar, which set off 9 other mortars individually. One mortar ran sideways and stuck the victim's leg.

Early or Late Ignition. In Case 25, a 19-year-old male lit a large firecracker and as he was about to throw it up in the air, the firecracker exploded quicker than he expected and fractured his finger. In Case 29, a 35-year-old male was setting off mortars. One of the mortars did not go off, so he went over to light it again after a few minutes. He was looking down when he relit it. The mortar exploded in his face and injured him within a second. In Case 30, a 38-year-old male was drinking while lighting a sparkler, which was

more than 1-year-old. The sparkler blew up very quickly and gave off a big spark that burned his thumb. In Case 32, a 50-year-old male made some firecrackers on July 4. When he held one and lit it, the firecracker blew up in his hand before he expected.

Tipover. In Case 6, a 31-year-old male lit a cannon-type firework and as the firework started to fall over, he grabbed it and set it back up. The firework exploded in his hand before he could get out of the way. In Case 27, a 20-year-old male was setting off aerial shells. One of the tubes fell over on the ground as he was lighting it. He grabbed the tube at the top and got burned in his left hand. In Case 33, a 51-year-old male was watching someone else setting off multiple tube devices. The container that held fireworks sat on a table. The first two fireworks went off okay. However, the container fell off the table and caused the third firework to go sideways and hit the victim in the left knee.

Other (3 victims injured, 9 percent)

In Case 17, a 6-year-old female did not see the bottle rocket shot off by her neighbor and was hit in the eye. In Case 20, a 9-year-old male was injured when he tried to light a firecracker (size unspecified) and instead, set his shirt on fire. In Case 28, a 33-year-old male was injured by an unspecified fireworks device lit by someone next to him in the street.

Long-Term Consequences of Fireworks-Related Injuries

Victims were asked if there were any long-term consequences of their injuries. Most (25 of 34, or 74 percent) expected complete recoveries with no long-term effects. Some of the victims who reported that they might experience long-term effects of the injuries were as follows:

- In Case 1, the victim lost his right index and middle fingers and thumb after a golf ball-shaped firework exploded in his right hand. He is not expected to gain full function of his right hand.
- In Case 2, the victim sustained third degree burns on his upper left leg when a spark from someone else's firework hit his pants, which caught fire. He still has lingering sensitivity in his left leg.
- In Case 4, the victim was hit in the right eye by a rocket and suffered acute vision loss and a large hyphema. After hospitalization and additional visits to an eye specialist, his vision is still blurry, and he is unsure if his vision will return.
- In Case 6, the victim burned his entire left hand when he grabbed a tipped over cannon-type firework to set it upright; the firework exploded in his hand. He was unsure if there would be any long-term nerve damage.
- In Case 8, the victim lit sparklers near an open cooler with flash powder in it. One sparkler landed in the cooler and ignited flash powder. The victim suffered second and third degree burns on his right foot to forearm (about 25 percent of his body). He has nerve damage and cannot lift his arm above his head.

- In Case 9, the victim lit a smoke bomb, and it blew up in his hand. He lost fingers and the palm of his hand. He does not expect to gain full function of his hand.
- In Case 17, the victim did not see the bottle rocket set off by her neighbor and was hit in the right eye. She suffered eye trauma, and her parent reported that she could get glaucoma because of the injury.
- In Case 23, the victim suffered a head injury at school when someone threw an unspecified firework under his chair. The victim, scared by the loud noise from the firework, hit his head against a wall and passed out. His parents were unsure if there would be any long-term effects from his injury.
- In Case 31, a 40-year-old male was hit by a piece metal from a firecracker set off by his neighbor. After additional medical treatment for the injury, he was unsure whether there would be any long-term effects.

Where Fireworks Were Obtained

Of the 34 telephone survey respondents, 18 (53 percent) knew where the fireworks were obtained. Twelve respondents reported that the fireworks had been obtained from a stand; 3 indicated the fireworks were obtained from a store; and 3 stated that the fireworks were acquired from a relative.

Fourteen victims (41 percent) reported that they did not know the source of the fireworks. This is typically the situation when the victim did not purchase or light the fireworks device that caused the injury.

One of the two remaining respondents stated that he made the firecrackers himself on July 4, 2010, and the other respondent refused to tell where the fireworks that injured him were obtained.

6. Enforcement Activities

The CPSC, through the Office of Compliance and Field Operations, oversees enforcement activities for all applicable regulations for consumer fireworks under the Federal Hazardous Substances Act (FHSA), 15 U.S.C. 1261–1278. CPSC staff's enforcement activities are focused on reducing the number of fireworks-related deaths and injuries. A variety of enforcement techniques and national, as well as international initiatives were used in 2010 to keep unsafe fireworks from consumers.

CPSC staff continues to work closely with U.S. Customs and Border Protection (Customs) to conduct surveillance on imported shipments of consumer fireworks. CPSC established permanent staffing at the Import Safety Commercial Targeting and Analysis Center (CTAC) in Washington, D.C., and is working in cooperation with Customs to implement new enforcement measures. In 2010, staff began implementing new procedures for identifying and selecting fireworks entries for examination and sampling. CPSC staff no longer requests all importers to fax consumer fireworks entry packets to the CPSC in

advance (as had been the practice for many years). Staff now notifies importers and brokers if their shipment has been identified for further examination. Follow-up correspondence is sent, indicating which items, if any, will be sampled and tested. Fireworks were selected for testing either at random or based on the past violation history of the type of device, whether the item had been sampled previously, and other factors. With assistance from Customs, CPSC staff selectively sampled and tested numerous shipments of imported fireworks in fiscal year 2010 for compliance with the FHSA. Approximately 43 percent of the shipments targeted by CPSC staff contained noncompliant fireworks. CPSC staff requested corrective action on these noncompliant fireworks, and in most cases, the firms voluntarily destroyed the noncompliant fireworks. Also, in June 2010, CPSC announced the recall of a violative fireworks device that had been sold to consumers.

Another enforcement activity that continues to remain a priority for CPSC staff is the investigation of firms and individuals that offer kits and components to make illegal and dangerous firecracker-type explosives, such as M-80s and Quarter Sticks. Since 2006, CPSC staff has worked with the U.S. Department of Justice on cases involving companies and/or individuals involved in selling the chemicals and components used to make illegal fireworks.

Also, CPSC staff continues to maintain close relations with the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), the Justice Department's Office of Consumer Litigation, as well as state and local law enforcement agencies. CPSC staff has provided training on consumer fireworks regulations to ATF's Industry Operations Investigators, as well as legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers.

Most fireworks are manufactured outside the United States and China (98 percent) and Hong Kong (1 percent) are the sources of most imported fireworks.⁹ In light of this, CPSC staff visited consumer fireworks factories in China to gain a better understanding of the manufacturing process. CPSC's agreement and subsequent Work Plans with its counterpart Chinese agency, the AQSIQ, provide for extensive information exchange and cooperation. CPSC staff participates in digital video conferences with AQSIQ technical staff to discuss consumer fireworks activities.

7. Summary

In 2010, there were 3 reported fireworks-related deaths, an increase from the 2 deaths reported in 2009. However, reporting for 2009 and 2010 may not be complete at this time. Emergency department-treated injuries, estimated at 8,600 for 2010, decreased

⁹ These data are from 2010 statistics from the U.S. International Trade Commission. There were 199.6 million pounds of fireworks imported, with 195.3 million pounds from China (98 percent), and 2.7 million pounds from Hong Kong (1 percent). Staff believes that most fireworks imported from Hong Kong were actually manufactured in China. The next largest exporter was Thailand, with 1.1 million pounds.

slightly from the estimated 8,800 injuries in 2009. The difference between the injury estimates for 2009 and 2010 is not statistically significant.

During the 1-month special study period from June 18, 2010 to July 18, 2010, there were an estimated 6,300 emergency department-treated injuries, somewhat greater than the 2009 estimate of 5,900 injuries. However, the difference is not statistically significant. Similar to previous years, in 2010, children under 15 years old experienced about 40 percent of the injuries, and males of all ages experienced 65 percent of the injuries.

Also similar to previous years, approximately more than half the injuries in 2010 involved burns. Burns were the most frequent injury to all parts of the body, except the eyes, where contusions, lacerations, and other diagnoses (mainly foreign bodies in the eye) occurred more frequently. The parts of the body most often injured were hands and fingers (estimated 30 percent of the injuries), legs (22 percent), eyes (21 percent), and the head, face, and ears (16 percent). Most injuries (92 percent) involved treat-and-release dispositions. An estimated 7 percent were treated and transferred to another hospital or admitted to the hospital where the emergency department was located.

Among the different types of fireworks, sparklers were associated with 19 percent of the injuries. Firecrackers were involved in 14 percent of the estimated injuries, and bottle rockets were associated with 6 percent of the injuries.

A review of data from telephone follow-up investigations showed that the typical causes of injuries were as follows: (1) misuse of fireworks, including mischief and improper use; (2) ignition and explosion of fireworks earlier than expected; (3) errant flight paths; (4) aerial shell device tipovers; and (5) debris and smoke associated with eye irritations. At the time of the telephone investigation, typically one to two months after the injury, most victims had recovered from their injuries. A small number of victims reported that the injuries were likely to have long-term effects.

Finally, in 2010, CPSC staff's enforcement activities remained at a high level. CPSC's Office of Compliance and Field Operations worked with Customs to sample imported fireworks and to seize illegal shipments. Staff provided legal, field, and technical support in cases involving the distribution of illegal explosive devices and the illegal diversion of professional fireworks to consumers. Staff also continued working with the Chinese government's AQSIQ. China is the world's largest exporter of fireworks, and most fireworks imported into the United States come from China. Fireworks is among one of four product areas targeted by the CPSC and AQSIQ for exchange of information on standards, increased inspection of high-risk products, and tighter quality controls on components from parts suppliers.

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Appendix A
Fireworks-Related Injuries and Fireworks Imported

Table A-1 shows that fireworks imports have generally risen over the period 1997–2008, peaking in 2005 at 275.1 million pounds, and then declining to 199.3 million pounds in 2009. Fireworks imports in 2010, 199.6 million pounds, were a little higher than they were in 2009. The number of estimated emergency department-treated injuries has fluctuated between 7,000 and 11,000, with the largest number of injuries occurring in the millennium year of 2000. During this period, as shown in Table A-1 below, the number of injuries per 100,000 pounds of fireworks has declined from 8.0 injuries per 100,000 pounds in 1997, to 3.4 injuries per 100,000 pounds in 2006 and 2008.

Injuries per 100,000 pounds were slightly lower in 2010, than the previous year at 4.3 injuries per 100,000 pounds.

Table A-1
Estimated Fireworks-Related Injuries and
Estimated Fireworks Imported into the U.S. 1996–2010

Year	Estimated Injuries	Estimated Fireworks	
		Imports (millions of pounds)	Injuries Per 100,000 Pounds
2010	8,600	199.6	4.3
2009	8,800	199.3	4.4
2008	7,000	208.3	3.4
2007	9,800	260.1	3.8
2006	9,200	272.1	3.4
2005	10,800	275.1	3.9
2004	9,600	230.0	4.2
2003	9,300	214.6	4.3
2002	8,800	175.3	5.0
2001	9,500	155.3	6.1
2000	11,000	146.2	7.5
1999	8,500	146.7	5.8
1998	8,500	123.8	6.9
1997	8,300	103.5	8.0
1996	7,300	108.6	6.7

Source: Injuries from NEISS, U.S. Consumer Product Safety Commission/EPHA. See Table 1 for further details. Estimated fireworks imports from the U.S. International Trade Commission, using Harmonized Tariff Schedule (HTS code 3604.10). Imports include consumer fireworks (1.4G HTS code 3604.10.90.10 and 3604.10.90.50) and display fireworks (1.3G HTS code 3604.10.10.00). Display fireworks were about 7.4 percent of the total imports in 2010. In addition to imported fireworks used in the United States, there is also a small amount of fireworks manufactured in the United States for domestic consumption, which is not available from the International Trade Commission and not shown in this table.

Although the table suggests a relationship between weight and the number of injuries, it should be interpreted with caution. First, the logical unit of exposure is the number of fireworks devices used, instead of the collective weight of the devices, because a person is exposed to injury when a device is consumed (*i.e.*, lit). Injuries per 100,000 fireworks devices imported might be more meaningful, but the number of devices imported is not available. Moreover, using weight overrepresents heavy devices and underrepresents light devices. There is no reason to assume that a heavy device is inherently more dangerous than a light device because the weight of the device includes things other than just the amount of explosive material.

Also, international trade statistics do not provide weight by fireworks device types. Thus, it is not possible to associate injuries with the weight of different types of fireworks imported. As shown in Table 2 earlier in this report, different fireworks devices have different numbers of injuries. Thus, the decrease in injuries per 100,000 pounds between 1996 and 2008 may be due to different mixtures of types of fireworks imported over time, or an overall decrease in injuries among all types of fireworks. Similarly, the decrease in injuries per 100,000 pounds in 2010 may have resulted from different fireworks mixtures, a decrease in injuries, or just statistical variation. The data do not provide enough information to determine the relative contribution of these factors.

**Appendix B
Completed Telephone Investigations**

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
1	11	Male	Amputation	Admit	Finger	Unspecified	Victim found an unused golf ball-shaped firework on beach and lit it. The firework exploded in his right hand. The victim lost right index and middle fingers and thumb.	After discharge, the victim had additional medical treatment for his injuries. He has not recovered yet, and is not expected to regain full function of his right hand.
2	14	Male	Thermal Burns	Admit	Upper Leg	Rocket Unspecified	Victim and his friends were lighting fireworks in the street. A rocket lit by someone else went sideways, and a spark from it hit the victim's pants, and they caught on fire. The victim suffered third degree burns on his upper left leg.	After being admitted to hospital overnight, the victim had additional medical visits and underwent surgery. The victim has not fully recovered, and the sensitivity in his leg is expected to go away within a year.
3	19	Male	Foreign Body	Admit	Upper Leg	Smoke Bomb	The victim's father lit a smoke bomb to fight off bugs as the victim was standing next to him. The smoke bomb blew up in his father's hand, and the debris from the fireworks hit the victim and lodged in his leg.	After emergency department and additional treatment, the victim fully recovered in two weeks.
4	22	Male	Other	Admit	Eye	Bottle Rocket	Victim was about 12 feet away from a lit bottle rocket. His friend held the rocket in his hand and then dropped it on the ground. The rocket skipped across the lawn and hit the victim in his right eye. The victim suffered acute vision loss and a large hyphema.	After hospitalization, the victim saw an eye specialist to check his eye. His vision is still blurry, and he is unsure if his vision will return fully.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
5	26	Male	Internal Injury	Admit	Upper Trunk	Sparkler	Victim made a sparkler bomb by wrapping a number of sparklers with duct tape. He set it on the ground and lit it; the sparkler bomb exploded before he could move away. The victim was hit in several places.	Victim was admitted to the hospital and had surgery to remove his skin and flesh from his right knee, hip, and leg. After discharge, the victim had additional medical visits to check the skin graft. He expects a full recovery in two or more months.
6	31	Male	Thermal Burns	Admit	Hand	Aerial Shell	The victim lit a cannon-type firework, and when it started to fall over, he grabbed it to set it back upright. Before he could get out of the way, the firework exploded in his hand. The victim's left thumb was hanging off, and his entire hand burned.	After discharge, the victim sought additional treatment for his injuries. There could be long-term nerve damage to his hand, but the victim doesn't know that for sure yet.
7	40	Female	Thermal Burns	Admit	Upper Trunk	Aerial Shell	The victim was seven or eight feet away from where aerial shells were setting off. One of the fireworks fell out the tube and went sideways, and the victim was hit in the chest.	The victim sustained burns to her chest and stomach. The victim has since fully recovered.
8	41	Male	Thermal Burns	Admit	25-50% of Body	Sparkler	Victim was lighting sparklers a few feet away from an open cooler containing flash (gun) powder. A sparkler landed in the cooler; the flash powder caught fire. Victim's leg was on the cooler; he sustained second and third degree burns from his right foot to his forearm (about 25% of his body).	The victim was hospitalized for a month. After discharge, he had additional medical visits to treat his injuries. The victim suffered nerve damage and cannot lift his arm above his head.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
9	42	Male	Amputation	Admit	Finger	Smoke Bomb	The victim set off smoke bombs to get rid of bugs, and one of the smoke bombs blew up in his hand. The victim lost his fingers and the palm of his hand, and had injury to his right eye and a 4-inch hole in his stomach.	The victim was still in the hospital as of the date of the telephone interview, and did not expect to gain full function in his hand.
10	2 Months	Female	Thermal Burns	Treated and Released	Lower Leg	Unspecified	The victim was carried by her mom to their car in a car seat. They had been watching fireworks set off by a neighbor a few houses away at her aunt's house. Some debris or sparks from the fireworks landed on the car seat, and the material of the car seat burned. The mother took the victim out of the car seat and noticed a red mark on her lower leg.	The victim suffered slight burn on her lower leg, and has fully recovered in seven days.
11	5 Months	Female	Other	Treated and Released	Eye	Unspecified	The victim was held by her aunt on the porch. A boy came down the street throwing some fireworks. The victim started to cry, and her aunt felt that she may have been hit in the eye by one of the sparks. The victim was taken to the hospital to be checked the next day, and she was fine.	The victim recovered the next day.
12	3	Male	Thermal Burns	Treated and Released	Upper Trunk	Sparkler	Victim was given a used sparkler that was still hot. He attempted to throw the sparkler, but it went down his shirt. He suffered second degree burns to his chest.	The victim has fully recovered after the emergency department treatment.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
13	3	Male	Thermal Burns	Treated and Released	Finger	Unspecified	Victim's older brother lit a firework and before he could throw it away, the victim grabbed the firework and held it in his hand. The firework exploded in the victim's hand.	Victim sustained second degree burns on his fingers. He fully recovered in 10 days.
14	4	Male	Contusions Abrasions	Treated and Released	Eye	Smoke Bomb	Victim's father lit some smoke bombs that shot off colored smoke. The victim ran into the smoke and leaned over to a smoke bomb on the ground. The tar holding wick was still "sizzling," and a small piece of tar shot into the victim's eye.	The victim suffered corneal abrasion. He has fully recovered.
15	6	Female	Thermal Burns	Treated and Released	Mouth	Bottle Rocket	Victim's father was igniting some "whistler" rockets on the school yard. The victim and her step-sister got one of the rockets, put it in a cone, and lit it with a punk stick. They didn't insert the rocket properly into the cone, and as a result, the rocket went into the victim's lip when ignited.	The victim sustained second degree burns to her lip. After additional medical treatment, the victim fully recovered in three weeks.
16	6	Female	Thermal Burns	Treated and Released	Foot	Firecracker Unspecified	Someone lit a firecracker, and sparks were on the ground, Victim didn't see the sparks and stepped on them.	Victim burned the bottom of her right foot. She was treated at emergency department and then sought more treatment. She has fully recovered.
17	6	Female	Foreign Body	Treated and Released	Eye	Bottle Rocket	Victim went outside just as her neighbor shot off a bottle rocket. Victim didn't see the rocket when it went off, and she was hit in the right eye.	Victim suffered eye trauma. She saw an eye doctor after treatment at emergency department. She may develop glaucoma due to the injury.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
18	7	Male	Thermal Burns	Treated and Released	Lower Arm	Fountain	The victim was watching his neighbor setting off fireworks. The neighbor was on the last aerial fountain firework. Instead of putting it on the ground, the neighbor held it in his hand and lit it. The firework ignited so fast that he dropped it and it went sideways. The sparks hit the victim's lower arm and stomach area causing third degree thermal burns.	The victim has fully recovered.
19	7	Male	Thermal Burns	Treated and Released	Hand	Sparkler	The victim was running around with a sparkler in his hand and waving it. The sparkler slipped into his hand and he got a second degree burn to his palm.	After emergency department and additional treatments, the victim has fully recovered in ten days.
20	9	Male	Thermal Burns	Treated and Released	Upper Trunk	Firecracker Unspecified	The victim tried to light a firecracker, and instead he lit his shirt on fire. The victim sustained first and second degree burns to his chest and stomach.	After treatment at emergency department, the victim has fully recovered in two weeks.
21	12	Female	Hematoma	Treated and Released	Head	Unspecified	When the victim and her family were getting out of their car on the driveway, a neighbor deliberately threw a string of fireworks at them. The popping sound frightened the victim, and she hit her head against the car door when she jumped backwards. The victim sustained hematoma to her head.	The victim recovered in two days.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
22	12	Male	Other	Treated and Released	Eye	Fountain	Victim didn't fully un-wrap the fuse of a fountain-type firework that he was lighting. As a result, the fuse was too short and the firework exploded near his face and caused a tiny hole in his retina.	The victim sought additional medical treatment after the emergency room visit, and he has fully recovered in a few days.
23	16	Male	Internal Injury	Treated and Released	Head	Unspecified	The victim was at school when another child threw a firework under his chair. The loud noise from the firework scared the victim, and he hit his head against a wall and passed out. The victim suffered head injury.	The victim had not yet recovered from his injury as of the date of the telephone interview, and his parents didn't know if there would be any long-term effects from the injury.
24	17	Male	Thermal Burns	Treated and Released	Hand	Sparkler	The victim and his friends were standing by an open door of a car to block wind so they could light sparklers. A spark flew into the back seat of the car and ignited a blanket. The victim grabbed the blanket and got thermal burns to the palm of his right hand.	After emergency department treatment, the victim fully recovered in two weeks.
25	19	Male	Fracture	Treated and Released	Finger	Large Firecracker	The victim lit a big firecracker and was about to throw it up in the air. The firecracker exploded quicker than he expected and fractured his index finger.	The victim fully recovered in a week.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
26	20	Male	Thermal Burns	Treated and Released	Upper Leg	Reloadable Aerial Shell	The victim was in his backyard when a neighbor ignited aerial shells about 25 feet away from him. The last shell went sideways through the cardboard box and hit the victim's chest. The victim rolled over and the shell hit his upper thigh and exploded.	The victim sustained third degree burns on right calf and second degree burns on both inner thighs. After treatment at emergency department, he fully recovered in two weeks.
27	20	Male	Laceration	Treated and Released	Hand	Aerial Shell	The victim was setting off reloadable aerial shells at a friend's home. One of the tubes fell over on the ground as he was igniting it. The victim grabbed the tube at the top and got first degree burns on his left hand around thumb.	Following treatment at emergency department, the victim completely recovered in two weeks.
28	33	Male	Contusions Abrasions	Treated and Released	Mouth	Unspecified	The victim was ready to set off fireworks in the street when he heard a loud boom. Someone next to him set off a firework, which hit the victim in face and cut his mouth. The victim didn't realize that the other person had lit the firework until he was hit.	After treatment at emergency room, the victim fully recovered in five days.
29	35	Male	Contusions Abrasions	Treated and Released	Eye	Aerial Shell	The victim was setting off mortar type of fireworks in a parking lot. One of the fireworks he lit didn't go off. After a few minutes the victim went over to light it again. He was looking down when he relit it. The firework exploded in his face within a second.	The victim suffered impact injury in his eyes and was legally blind for a week. After treatment at emergency department, the victim saw an eye specialist to evaluate his injury. He hasn't recovered yet, but expects the swelling in his eyes to go down within three months.

Case Number	Age	Sex	Diagnosis	Disposition	Body Part	Fireworks Type	Incident Description	Medical Treatment and Prognosis
30	38	Male	Thermal Burns	Treated and Released	Finger	Sparkler	The victim was drinking and lit a year-old sparkler. The sparkler blew up very quickly and gave off a big spark that burned his thumb.	The victim sustained second degree burns to his thumb. After emergency department and additional treatment, he fully recovered in 20 days.
31	40	Male	Foreign Body	Treated and Released	Ankle	Firecracker Unspecified	The victim was in the backyard, and one of the firecrackers set off by his neighbor went sideways and hit him at ankle. The victim did not realize that he was hit until it started to swell 10 or 15 minutes later. He went to the hospital the next day and was told that a piece of metal from the firework was in his ankle.	After treatment at emergency department, the victim had additional visits to doctors for checkups. He had not yet recovered at the time of the telephone interview, and didn't know if there would be any long-term effects from the injury.
32	50	Male	Laceration	Treated and Released	Hand	Homemade	The victim made some firecrackers on July 4. When he held one in his hand and lit it, the firework blew up in his hand before he got a chance to throw it.	The victim sustained lacerations to his right hand. Following emergency department and further treatment, he fully recovered in a week.
33	51	Male	Contusions Abrasions	Treated and Released	Lower Leg	Multiple Tube Device	The victim was watching someone else setting off multiple tube-type fireworks. The container that held fireworks was sitting on a table. The first two fireworks went off okay. However, the container fell off the table and caused the third firework to go sideways and hit the victim in the left knee.	The victim's left knee was bruised and infected. He had additional medical visits to treat infection after treatment at emergency room. The victim has not recovered and expects a full recovery within six weeks.