

Appendix 109  
June 1, 1992

## FIREWORKS

### I. INTRODUCTION

#### A. Background Information

CPSC mandatory regulations on fireworks have been in effect since 1976. In 1992, CPSC has a project to gather data to evaluate the effectiveness of the current regulations. Data analysis will be in Fiscal Year 1993.

Estimates indicated that hospital emergency room treated fireworks-related injuries have remained relatively stable over the last decade. An estimated 11,200 injuries associated with fireworks were treated in hospital emergency rooms during 1991. About three-fourths of these, 8,100, occurred during the one-month period surrounding July 4. More than two-thirds of the injuries involved fireworks devices covered by CPSC's regulations, small firecrackers and other common fireworks.

In spite of the required labeling for fireworks ("use only under adult supervision"), over half the injuries (55 percent) were to children under age 15. Altogether children and teenagers accounted for about 65 percent of the injuries, while 24 percent of the total injuries were among people in the 25 - 44 year age group. Children 10-14 years old suffered the highest rate of fireworks-related injuries per 100,000 population.

#### B. Specific Items of Interest

We are interested in determining the specific kinds of fireworks that are causing injuries and evaluating whether the product met current fireworks regulations. On-site investigations will be requested on a number of these incidents, particularly where the fireworks may not have operated as intended or expected, or where child misuse was involved. In these cases, samples of similar fireworks (preferably from the same package) need to be collected so that malfunctions related to the injury can be tested. Given the transient nature of many places that sell fireworks, immediate contact is crucial. If the consumer does not have any item like the one causing the injury, try to obtain samples from the same location. (You should obtain 18 units.) Of particular interest are incidents involving early or delayed ignition of fireworks. (The current regulation specifies an acceptable fuse burn time of 3 to 6 seconds.) Specify the type and overall length of the fuse, describe how and for how long the fuse burned before the device functioned. Describe any difficulty in getting far enough away before the fireworks exploded.

Also, we particularly are interested in learning how children under age 15 are injured. Were they using the fireworks properly; were they appropriately supervised; are they bystanders? Bear in mind that the ultimate question of interest is whether it is possible to change the regulation(s) in a way that could have prevented this injury. To this end, we want to determine the extent to which either product malfunction or misuse is involved.

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## II. INSTRUCTIONS FOR COLLECTING SPECIFIC INFORMATION

### A. Synopsis

Provide a brief summary of the accident sequence. Describe the product in detail. Indicate the factors that contributed to the accident, such as product malfunction, condition of product prior to use (i.e., fuse loose, deformed, or broken casing/base), lack of adult supervision, lack of knowledge about how the product functions, cautionary labeling, body position relative to lighting the device, peer group pranks, and type of ground surface (smooth, rough, paved, grass, etc.).

For data retrieval from the computer, please be sure the following key words are used in the synopsis as appropriate: malfunction/tipover/early ignition/delayed ignition/held in hand/misuse.

### B. Description of Victim Contact with Product

Describe the accident scenario, including how all injuries or deaths were incurred. Use diagrams or photographs (reconstruction) as appropriate to illustrate the victim's involvement with the fireworks during the incident, including the victim's distance from the fireworks. If the victim was injured while lighting the device, include his body position relative to lighting the fireworks when the accident occurred. (Did he bend over, or stoop down to light it?) Describe any difficulty in getting far enough away before the fireworks exploded. Indicate whether the victim was the user of the device or a bystander, etc. and has familiarity with the product. If he was holding it in his hand when it exploded, describe the circumstances (e.g., did he intend to throw it?). Describe victim's previous experience with this type of device and fireworks in general.

C. Description of Product

- Determine the product name, manufacturer/brand name or label, point of origin, and retailer (place of purchase). Copy all marking. Indicate the type of fireworks as specifically as possible and describe the design (i.e., ball shaped, cone shaped, etc.), the composition (made from paper, cardboard, plastic, styrofoam, etc.), size in inches, and number of devices sold in a package. Diagrams with measurements are suggested.
- Indicate whether there was a cautionary label on the individual fireworks, on the retail box or carton, or on any other devices which assists in the operation of the fireworks (e.g., the launcher tube sold with Type H, reloadable shell fireworks). Copy all labeling and indicate its location.
- Describe the fireworks fuse if available. Determine the fuse length, its color, and indicate whether the fuse was securely attached. Indicate if the fireworks appeared to have leaked powder prior to lighting the device.
- Determine if there was a problem lighting the fuse.
- Indicate if the fireworks device operated sooner (early ignition) or later (delayed ignition) than expected after lighting. Did it burn more quickly than others that were lit previously? Did the fuse burn irregularly, etc.? Determine the length of time the consumer expected and why (e.g., previous ones lit took a longer time to function).
- Indicate any other peculiarities after lighting the fireworks device (i.e., exploded in hand, tipover).
- If product was a reloadable shell, specify shell diameter (preferably as marked on its box).
- If product was a missile or rocket, describe the size and configuration of its base, or attached stick. Determine if the stick was straight or bent.
- Indicate if fragments that hit the ground were still burning.
- Indicate if product was homemade or whether it was an item being used as part of a public display. If fireworks were used by members of the audience at such a display, it is not considered part of the public display.

D. Description of Victim

- Indicate the victim's age, sex, height, and any competence-reducing factors (e.g., impaired vision, physical handicaps, medication, alcohol, etc.) that may have been present at the time of the accident.
- Describe how the victim was clothed at the time of the accident (including protective goggles that may have been worn).
- Describe the nature and extent of the injuries, with special attention to the points of impact (and if possible, the sequence of impact) and the body parts involved. Indicate the body part(s) treated, and the type of treatment received. If a head injury was involved, find out if the victim lost consciousness or felt any dizziness, nausea, or headaches. Determine length of hospital stay and if there were any lasting or permanent effects due to the accident (i.e., permanent loss of sight, amputation). Include medical records of treatment, including hospital records, ER records, and records of subsequent treatment received, particularly for head, eye, and other serious injuries. If death occurred, obtain medical examiner, coroner, or other relevant reports.
- Determine if there were any injured bystanders nearby at the time of the accident. If so, describe the nature and extent of the injuries incurred by the bystanders.

E. Description of Environment

- Indicate the time of day of the accident, and the amount of daylight or other lighting present.
- Describe the weather conditions at the time of the accident, including temperature, precipitation, and visibility.
- Report the location of the accident (e.g., home yard or driveway, sidewalk, school yard, park, recreation center playground, field, public display area).
- Report the surface (level or sloped) and surface type and condition (i.e., hard cement, wet slippery grass, sandy clay court, rocky field, etc.)

### **III. INSTRUCTIONS FOR PHOTOGRAPHING AND DIAGRAMING FIREWORKS AND ACCIDENT SEQUENCE**

Obtain color photographs of the types of fireworks to illustrate the construction design, labeling, instructions, and features of particular interest. Attempt to reconstruct the accident situation. Include measurements of the distance(s) the victim was from the fireworks when it exploded (the location of the fireworks components, just prior to and at the time of impact), and the position of the head and body at the time of the impact if the incident occurred while lighting. Diagram product configuration, stand, etc., with measurements.

### **IV. INSTRUCTIONS FOR OBTAINING DOCUMENTS AND SAMPLES RELATED TO FIREWORKS INVESTIGATIONS AND SHIPPING**

Obtain a copy of the fire department report if the fireworks started a structural fire. If a serious injury or death occurred, obtain a copy of the casualty and hospital reports.

Collect multiple units of the fireworks as a sample (18 units if possible) in every case possible. Specify whether the product was obtained from the consumer or purchased at a stand/store.

All samples should be sent in the approved Department of Transportation (DOT) 12-B box via Federal Express to:

ATTN: Neil Gasser  
U.S. Consumer Product Safety Commission  
Health Sciences Laboratory  
9620 Medical Center Drive  
Rockville, MD 20850

Place the fireworks sample in a plastic bag and seal it before mailing. If the device contains pyrotechnic material, i.e, it only partially functioned or is one of several identical devices, apply a DOT Class C Fireworks shipping label to the box.

The Sample Collection Report should always specify:

- The task number of the investigation.
- The CPSC Directorate that requested the sample. Also, the investigation report should reference the sample collection report number and the type of materials sampled.