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**LOG OF MEETING**

CPSC/OFC OF THE SECRETARY

**SUBJECT:** Electrical Fires and CPSC Staff Activities Addressing  
Fires Involving Home Appliances

1998 FEB 18 A 9:18

**DATE:** February 12, 1998 **PLACE:** Room 612  
East West Towers

**DATE OF LOG ENTRY:** February 13, 1998

**SOURCE OF LOG ENTRY:** William H. King, Jr., ESEE *W.H.K.*

**CPSC PARTICIPANTS:**

William H. King, Jr., ESEE  
Edward Krawiec, LSEL

**NON-CPSC PARTICIPANTS:**

Peter G. Sparber, Sparber and Assoc, Inc. (representing the  
National Assoc. of State Fire Marshals)  
Debi Richardson, The Society of the Plastics Industry, Inc.  
Christine Eames, Product Safety Letter

**SUMMARY:**

Mr. Sparber requested this meeting to discuss the CPSC staff activities addressing electrical fires and the specific activities addressing fires involving home appliances.

Mr. King provided an overview of the presentation previously given to the National Association of State Fire Marshals, Science and Technology Group on January 22, 1998. Mr. Sparber was not present at the January 22 meeting. A copy of the presentation outline is attached.

Mr. King provided some updated information on the status of several activities. Regarding plastic appliance enclosures, Mr. King indicated that progress had been made on several points with the UL Plastics Flammability Ad Hoc Group which is addressing the flammability issues raised by the CPSC staff. The next meeting of this group is scheduled for June 16, 1998.

Mr. King also reported that the staff work on countertop cooking appliances was progressing with proposals for toasters and toaster-oven appliances under consideration by UL and their technical advisory panel (TAP). At an upcoming meeting of this panel in April, further progress toward improving the safety standards is expected. The issue of defining when an appliance is considered attended verses unattended will be covered at this meeting. This is important because the applicable requirements in standards vary depending on whether an appliance is considered attended by the user or not.

Mr. Sparber thanked Mr. King for providing the explanation and update.



**CPSC ACTIVITIES ADDRESSING  
FIRES INVOLVING HOME APPLIANCES**

**PRESENTED TO THE  
NATIONAL ASSOCIATION OF STATE  
FIRE MARSHALS  
SCIENCE AND TECHNOLOGY ADVISORY GROUP**

**January 22, 1998**

## **FIRES INVOLVING HOME APPLIANCES**

- **DATA AND TRENDS**
- **OVERVIEW OF CPSC ACTIVITIES**
- **REVIEW AND STATUS OF SPECIFIC ACTIVITIES**



## RESIDENTIAL FIRE LOSS ESTIMATES - 1995

**Total Residential:**                    **425,500 fires**  
                                                 **3,695 deaths**  
                                                 **19,125 civilian injuries**  
                                                 **\$4,363 million property loss**

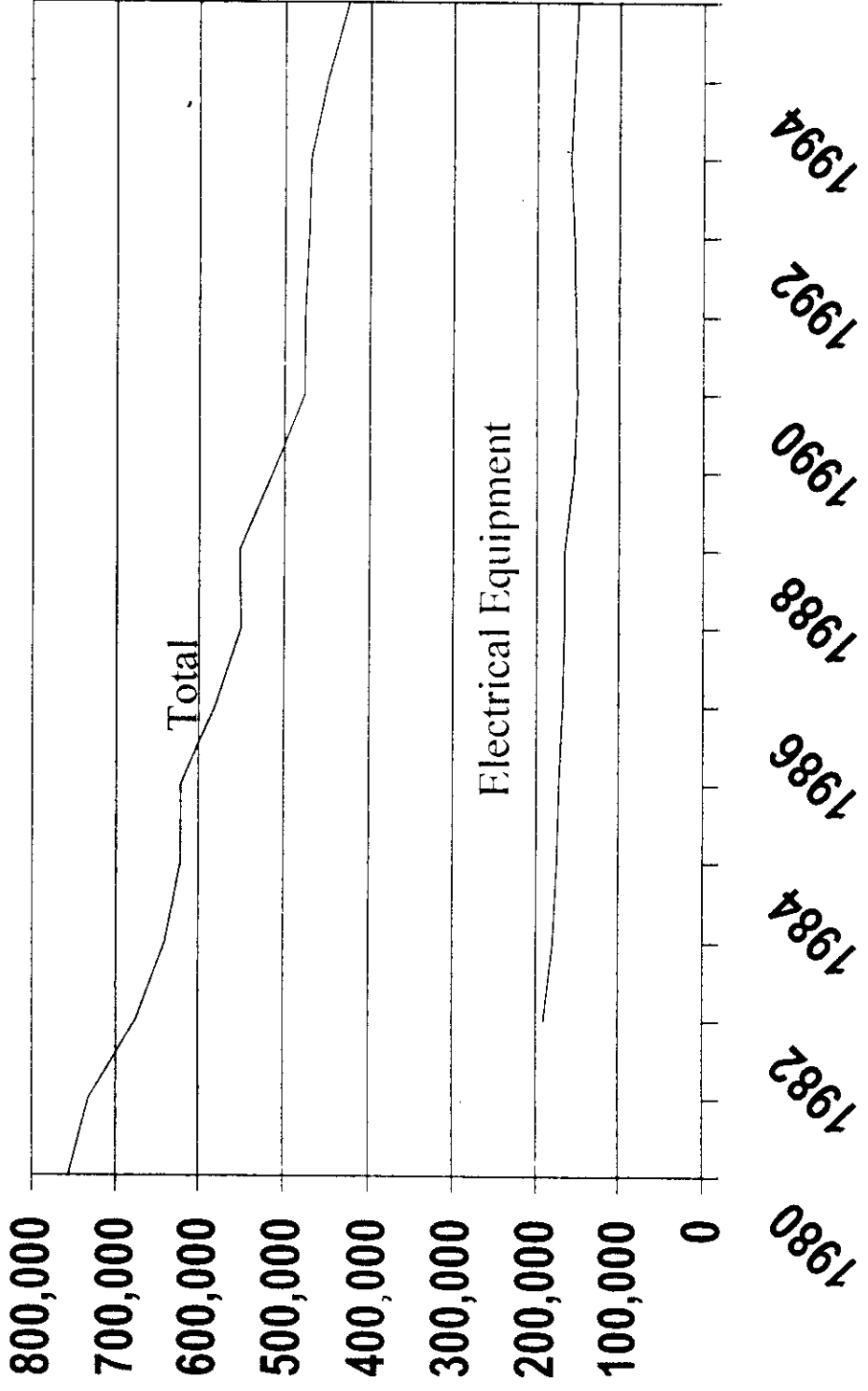
**Total Electrical:**                    **152,500 fires**  
                                                 **790 deaths**  
                                                 **6,250 civilian injuries**  
                                                 **\$1,293 million property loss**

### Selected Electrical Equipment:

<b>Electrical Distribution:</b>	<b>42,100 fires, 380 deaths</b>
<b>Electrical Heating Equipment:</b>	<b>10,700 fires, 100 deaths</b>
<b>Electrical Cooking Equipment:</b>	<b>58,400 fires, 110 deaths</b>
<b>Range/Oven:</b>	<b>50,700 fires, 70 deaths</b>
<b>Toaster/Toaster Oven</b>	<b>3,100 fires, 20 deaths</b>
<b>Microwave Oven</b>	<b>1,500 fires, 10 deaths</b>
<b>Other Countertop Cooking</b>	<b>2,400 fires, 10 deaths</b>
<b>Electrical Appliances</b>	<b>20, 000 fires, 110 deaths</b>
<b>Clothes Dryer</b>	<b>9,000 fires, &lt;10 deaths</b>
<b>Fan</b>	<b>2,600 fires, 10 deaths</b>
<b>Washing Machine</b>	<b>1,400 fires, 10 deaths</b>
<b>Heat Tape</b>	<b>1,100 fires, 10 deaths</b>
<b>Television</b>	<b>1,000 fires, 20 deaths</b>
<b>Iron</b>	<b>500 fires, 10 deaths</b>
<b>Dishwasher</b>	<b>1,000 fires, 10 deaths</b>
<b>Radio, Cassette Player</b>	<b>800 fires, 20 deaths</b>
<b>Hair Dryer, Curling Iron</b>	<b>600 fires, 10 deaths</b>
<b>Electric Blanket</b>	<b>300 fires, 20 deaths</b>
<b>Refrigerator/Freezer</b>	<b>1,100 fires, 20 deaths</b>
<b>Room Air Conditioner</b>	<b>1,500 fires, &lt;10 deaths</b>

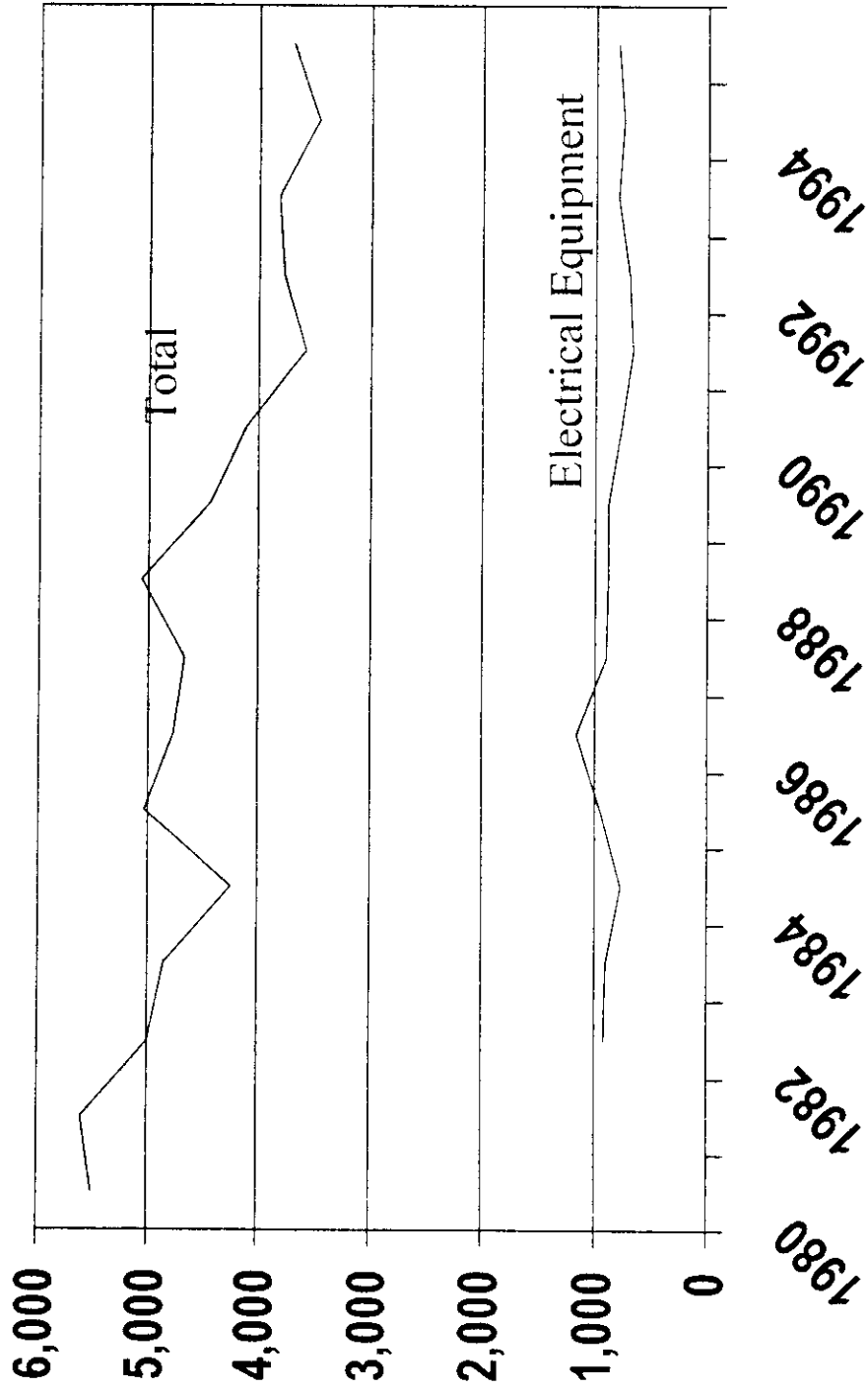
Source: CPSC 1995 Residential Fire Loss Estimates

# Estimated U.S. Residential Structure Fires



Source: CPSC data

# Estimated U.S. Residential Structure Fire Deaths



Source: CPSC data



## **CPSC ACTIVITIES ADDRESSING FIRES INVOLVING HOME APPLIANCES**

### **Range/Oven Fire Prevention**

#### **Countertop Cooking Appliances**

- Toaster, Toaster-Oven**
- Coffeemaker**
- Deep Fat Fryer**
- Breadmaker**

#### **Major Appliances**

- Clothes Dryer**
- Dishwasher**

#### **Plastics Flammability of Electrical Product Enclosures**

- Portable Fan**
- Portable Heater**
- Portable Humidifier/Vaporizer/Dehumidifier**
- Clothes Iron**
- Air Freshener**
- Baby Monitor**
- Battery Charger**
- Radio and related electronics**
- Telephone Answering Machine**

#### **Extension Cords (household, light-duty, unlisted)**

#### **Battery-Operated Products**

- Ride-On Toy Cars**

#### **Portable Halogen Lamps**

#### **Arc Fault Circuit Interrupters**

#### **Product Recalls and Compliance**



## **RANGE/OVEN FIRE PREVENTION**

- **PROBLEM:**
  - **84,600** fires annually
  - **220** deaths
  - **over \$269 million** in property loss
  
- **APPROACH:**
  - **Study engineering feasibility of detecting and responding to pre-ignition conditions of cooking-related fires associated with electric and gas ranges.**
  
- **STATUS:**
  - **Report on all work completed to date (1994-1997) scheduled to be released in the next month.**
  - **Meeting with interested parties planned for Spring, 1998.**
  - **CPSC technical staff continuing with work in 1998 by demonstrating an engineering model of one system for detecting and responding to an imminent cooking fire before it occurs.**





## **COUNTERTOP COOKING APPLIANCES**

### **TOASTERS/TOASTER OVENS**

#### ● **PROBLEM:**

- 3,100 fires annually
- 20 deaths
- over \$19 million in property loss

#### ● **APPROACH:**

- Review existing voluntary standards, compliance case files, in-depth investigations and consumer complaints to determine range of failures; conduct testing as required
- Recommend new or modified voluntary standards
- Coordinate effort with Underwriters Laboratories and Association of Home Appliance Manufacturers

#### ● **STATUS:**

##### • **Toasters:**

In 1997, CPSC staff proposed upgrading UL standard based on analysis of field reports. Toasters should be fail-safe (no food fire) if automatic (pop-up) mechanism becomes stuck while toasting. Proposal presently under consideration by UL. UL analysis and recommendations expected this Spring.

##### • **Toaster-Ovens:**

In response to field reports of kitchen fires, CPSC staff tested all popular models. CPSC staff noted that operating controls (automatic shut-off, time/temperature, bake/toast mode) are involved in failures that led to kitchen fires.

CPSC staff proposing upgrade of UL standard to require fail-safe operation (no kitchen fires) when unit tested with operating controls by-passed. Proposal presently under consideration by UL.

UL/Industry considering a test that would require containment of a food fire.

## **COUNTERTOP COOKING APPLIANCES (cont'd.)**

### **COFFEEMAKERS**

- **PROBLEM:**
  - 600 fires annually, and over \$3.9 million in property loss. Data relatively constant over last decade.
  - Improved UL safety standard five years ago followed numerous product recalls and fire reports associated with automatic drip models.
  
- **APPROACH:**
  - CPSC staff plan to evaluate current automatic drip models in the upcoming months.
  - Staff assessment will focus on safety improvements in place, and if additional measures are needed; i.e., did upgrade to UL standard address failure mechanisms?

### **DEEP FAT FRYERS**

- **PROBLEM:**
  - 300 fires annually, 20 injuries (including several severe burns to children)
  
- **APPROACH:**
  - CPSC staff currently revisiting issue to determine if further changes to the UL standard are necessary. UL standard was upgraded a decade ago.

## **COUNTERTOP COOKING APPLIANCES (cont'd.)**

### **BREADMAKERS**

- **PROBLEM:**
  - **New popular countertop cooking appliance with an unproven track record.**
  
- **APPROACH:**
  - **CPSC staff plan to analyze current designs on the market to become familiar with the construction. This will prepare the staff to address product safety issues if they develop.**



## PLASTIC APPLIANCE ENCLOSURES

- **PROBLEM:**
  - Thousands of portable appliance fires reported each year
  - Many operate unattended, where internal components fail and ignite enclosures
  - Examples: portable heaters, irons, fans, humidifiers, battery chargers, telephone answering machines
  
- **APPROACH:**
  - Improve the voluntary safety standard for plastic enclosure materials
  - Coordinate with Underwriters Laboratories, Society of the Plastics Industry, and appliance manufacturers
  
- **STATUS:**
  - In 1996, CPSC staff proposed change to UL 746C to upgrade minimum flammability requirement for portable household appliances that can operate unattended. UL tabled proposal.
  - CPSC staff testing appliances and enclosure specimens. Results presently being analyzed. Report/recommendations this spring.
  - CPSC interacting with UL Plastics Flammability Ad Hoc Group which is addressing the flammability issues raised by the CPSC staff.



## **OTHER HOME APPLIANCE RELATED ACTIVITIES**

### **MAJOR APPLIANCES**

#### **CLOTHES DRYERS (GAS & ELECTRIC)**

- **PROBLEM:**
  - 15,800 fires annually
  - 10 deaths, 290 injuries
  - over \$74 million in property loss
  
- **APPROACH:**
  - Beginning in 1998, CPSC staff will investigate the causes of reported fires associated with clothes dryers and determine if changes to the voluntary safety standards (ANSI Z21 and UL 560) are necessary.

#### **DISHWASHERS**

- **PROBLEM:**
  - 1000 fires annually
  - 10 deaths, 40 injuries
  - over \$8 million in property loss
  - Possible emerging hazard
  
- **APPROACH:**
  - Beginning in 1998, collect incident reports and analyze for failure modes and mechanisms. Assess hazard patterns and addressability in UL standard.

## **OTHER HOME APPLIANCE RELATED ACTIVITIES (cont'd)**

### **EXTENSION CORDS**

#### **● PROBLEM:**

- **3,700 fires annually**
- **40 deaths, 240 injuries**
- **over \$59 million in property loss**
- **Many products in marketplace lack independent laboratory certification, and use severely undersized wiring, lack adequate child resistant construction, and lack accurate ratings and other safety messages.**

#### **● APPROACH/STATUS:**

- **From the comprehensive UL voluntary standard for cord sets, CPSC staff identified the essential minimum safety requirements for the light-duty household type extension cords commonly used around homes. These are being put in the form of guidelines by UL for minimum safety of these products. The guidelines will be used to inform importers and manufacturers.**

### **BATTERY-OPERATED PRODUCTS**

#### **● PROBLEM:**

- **Over 400 electrical mishaps (e.g., overheating, short circuits, fires) involving high-current battery-operated toys (in particular, ride-on vehicles) have been reported to CPSC in the last five years.**

#### **● APPROACH/STATUS:**

- **Develop and propose appropriate electrical safety requirements for the voluntary ASTM Toy Safety Standard F 963. Proposal submitted by CPSC staff in 1997. ASTM work group presently considering the proposal.**

## **OTHER HOME APPLIANCE RELATED ACTIVITIES (cont'd)**

### **PORTABLE HALOGEN LAMPS**

- **PROBLEM:**
  - Approx. 200 fires and 11 deaths since 1992 with torchieres types with exposed high wattage tubular bulbs. Fire/burn hazards also reported with portable work lights that use these bulbs.
- **APPROACH/STATUS:**
  - Develop and propose appropriate safety requirements for the voluntary safety standard, UL 153. Submitted several proposals in 1997 to improve the current requirements.
  - Meeting scheduled for February, 1998 with UL and industry to discuss the latest proposals and the effective date.

### **ARC FAULT CIRCUIT INTERRUPTERS**

- **PROBLEM:**
  - Arcing faults have been identified as a major cause of residential electrical fires, particularly in appliances and flexible cords. Conventional circuit breakers and fuses are not effective in addressing arcing faults.
- **APPROACH/STATUS:**
  - New technology arc fault circuit interrupters (AFCIs) have been identified in work sponsored by CPSC and others, and recently several AFCI products have been introduced into the marketplace.
  - A proposal to include a requirement for AFCIs in the 1999 National Electrical Code for bedroom circuits is in the final phase of adoption.
  - CPSC staff are testing AFCIs to confirm their performance.



## **FIRES INVOLVING HOME APPLIANCES**

### **SUGGESTIONS FOR SUPPORTING CPSC**

- **Participate in UL Plastics Flammability Ad Hoc Group**
- **Survey members for written documentation of incidents involving the specific products being looked at in CPSC's home appliance fire related activities. Provide the results informally to the CPSC staff.**
- **Support new technology "Arc Fault Circuit Interrupters" that respond to appliance malfunctions that result in arcing and lead to fire.**