UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

This document has been electronically approved and signed.

DATE: October 2, 2014

THIS MATTER IS NOT SCHEDULED FOR A BALLOT VOTE.
A DECISIONAL MEETING FOR THIS MATTER IS SCHEDULED ON: _____

TO: The Commission
Todd A. Stevenson, Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director

FROM: Patricia M. Pollitzer, Assistant General Counsel
Mary A. House, Attorney, OGC

SUBJECT: Proposed Rule to Amend Substantial Product Hazard List to include Seasonal and Decorative Lighting Products

The Office of the General Counsel is providing for Commission consideration the attached draft proposed rule for publication in the *Federal Register*. The proposed rule would amend the Commission's rule at 16 C.F.R. part 1120, Substantial Product Hazard List, to state that seasonal and decorative lighting products that do not contain one or more of three readily observable characteristics (minimum wire size, sufficient strain relief, or overcurrent protection) constitute a substantial product hazard under the Consumer Product Safety Act (CPSA). By voting to publish the draft proposed rule, the Commission is making a preliminary determination that seasonal and decorative lighting products that do not contain one or more of the three identified characteristics present a substantial product hazard.

Please indicate your vote on the following options:

I. Approve publication of the attached document in the *Federal Register,* as drafted.

_____ _____
(Signature) (Date)

II. Approve publication of the attached document in the *Federal Register*, with changes. (Please specify.)

_____

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(Signature) (Date)

III. Do not approve publication of the attached document in the *Federal Register*.

_____ _____

(Signature) (Date)

IV. Take other action. (Please specify.)

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_____ _____

(Signature) (Date)

Attachment: Draft *Federal Register* Notice: Proposed Rule to Amend Substantial Product Hazard List to include Seasonal and Decorative Lighting Products

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1120

CPSC Docket No. CPSC-2014-00XX

Substantial Product Hazard List: Seasonal and Decorative Lighting Products

AGENCY: Consumer Product Safety Commission

ACTION: Notice of proposed rulemaking

SUMMARY: The Consumer Product Safety Commission (CPSC or Commission) is proposing a rule to specify that seasonal and decorative lighting products that do not contain one or more of three readily observable characteristics (minimum wire size, sufficient strain relief, or overcurrent protection) constitute a substantial product hazard under the Consumer Product Safety Act (CPSA).

DATES: Written comments must be received by [INSERT DATE THAT IS 75 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: You may submit comments, identified by Docket No. CPSC-2014-00XX, by any of the following methods:

Electronic Submissions

Submit electronic comments in the following way:

Federal eRulemaking Portal: http://www.regulations.gov. Follow the instructions for submitting comments.

The Commission is no longer accepting comments submitted by electronic mail (e-mail), except through www.regulations.gov.

Written Submissions

Submit written submissions in the following way:

Mail/Hand delivery/Courier (for paper, disk, or CD-ROM submissions), preferably in five copies, to: Office of the Secretary, Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814; telephone (301) 504-7923.

Instructions: All submissions received must include the agency name and docket number for this rulemaking. All comments received may be posted without change, including any personal identifiers, contact information, or other personal information provided, to: http://www.regulations.gov. Do not submit confidential business information, trade secret information, or other sensitive or protected information electronically. Such information should be submitted in writing.

Docket: For access to the docket to read background documents or comments received, go to: http://www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: Arthur Lee, Office of Hazard Identification and Reduction, Consumer Product Safety Commission, National Product Testing and Evaluation Center, 5 Research Place, Rockville, MD 20850; telephone: 301-987-2008; alee@cpsc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

The Commission proposes to issue a rule under section 15(j) of the CPSA, 15 U.S.C. 2064(j), that would amend the substantial product hazard list in 16 CFR part 1120 (part 1120). The substantial product hazard list in part 1120 would be amended to add three readily observable characteristics of seasonal and decorative lighting products: (1) minimum wire size; (2) sufficient strain relief; and (3) overcurrent protection. If the amendment to part 1120 is

finalized, seasonal and decorative lighting products that do not contain one or more of these characteristics would be deemed to create a substantial product hazard under section 15(a)(2) of the CPSA because such products pose a risk of electrical shock or fire. These three electrical safety characteristics for seasonal and decorative lighting products have been addressed in a voluntary standard, Underwriters Laboratories (UL), *Standard for Safety for Seasonal and Holiday Decorative Products,* UL 588, 18th Edition, approved on August 21, 2000 (UL 588).

As detailed in this notice, the Commission determines preliminarily that:

- minimum wire size, sufficient strain relief, and overcurrent protection are all readily observable characteristics of seasonal and decorative lighting products;
- these three readily observable characteristics are addressed by a voluntary standard, UL 588;
- conformance to UL 588 has been effective in reducing the risk of injury from shock and fire associated with these readily observable characteristics; and
- seasonal and decorative lighting products sold in the United States substantially comply with UL 588.

A. Background and Statutory Authority

Section 223 of the Consumer Product Safety Improvement Act of 2008 (CPSIA), amended section 15 of the CPSA, 15 U.S.C. 2064, to add a new subsection (j). Section 15(j) of the CPSA provides the Commission with the authority to specify, by rule, for any consumer product or class of consumer products, characteristics whose existence or absence are deemed a substantial product hazard under section 15(a)(2) of the CPSA. Section 15(a)(2) of the CPSA defines a "substantial product hazard," in relevant part, as a product defect which (because of the pattern of defect, the number of defective products distributed in commerce, the severity of the

risk, or otherwise) creates a substantial risk of injury to the public. For the Commission to issue a rule under section 15(j) of the CPSA, the characteristics involved must be "readily observable" and have been addressed by a voluntary standard. Moreover, the voluntary standard must be effective in reducing the risk of injury associated with the consumer products, and there must be substantial compliance with the voluntary standard.

The Commission has issued two previous rules under section 15(j) of the CPSA involving drawstrings on children's upper outerwear (76 FR 42502, July 19, 2011) (drawstring rule) and integral immersion protection on handheld hair dryers (76 FR 37636, June 28, 2011) (hair dryer rule). The Commission did not define a "readily observable" characteristic in either rule. In the proposed drawstring rule (75 FR 27497, 27499, May 17, 2010), the Commission found that the requirements detailed in the relevant voluntary standard could be evaluated with "simple manipulations of the garment, simple measurements of portions of the garments, and unimpeded visual observation." The Commission stated: "more complicated or difficult actions to determine the presence or absence of defined product characteristics also may be consistent with 'readily observable.'" Finally, the Commission stated its intent to evaluate "readily observable" characteristics on a case-by-case basis. 75 FR at 27499.

B. Seasonal and Decorative Lighting Products

1. Product Description

The proposed rule uses the phrase "seasonal and decorative lighting products" to identify the lighting products that are within the scope of the rule. The Commission proposes to define "seasonal and decorative lighting products" consistent with the description of products subject to the applicable voluntary standard, as set forth in section 1 of UL 588:

> Portable, plug-connected, temporary-use lighting products and accessories that have a nominal 120 volt input voltage rating. Lighting products within the scope of the rule are factory-assembled with push-in, midget- or miniature-screw base lampholders connected in series or with candelabra- or intermediate-screw base lampholders connected in parallel, directly across the 120 volt input. Such lighting products include lighted decorative outfits, such as stars, wreathes, candles without shades, light sculptures, blow-molded (plastic) figures, and animated figures. Lighting products outside the scope of the rule include: battery-operated products; products that operate from a transformer or low-voltage power supply; flexible tube lighting strings of lights intended for illumination; and portable electric lamps that are used to illuminate seasonal decorations.

This definition of "seasonal and decorative lighting products" is adapted from descriptions of lighting products defined in section 1 of UL 588. All in-scope products are covered by UL 588. Lighting products within the scope of the rule are typically used seasonally and provide only decorative lumination. The products typically are displayed for a relatively short period of time and then removed and stored until needed again. UL 588 section 2.43 defines the term "seasonal (holiday) product" as "[a] product painted in colors to suggest a holiday theme or a snow covering, a figure in a holiday costume, or any decoration associated with a holiday or particular season of the year." UL 588 defines "decorative light products" (decorative outfits) as factory-assembled, electrically powered units providing a seasonal or holiday decorative display having illumination or other decorative effects. A decorative product may contain a lighting string as part of the decorative illumination. A lighting string provided with decorative covers over the lamps is a decorative outfit. If not constructed properly, lighting

powered by 120 volts can be damaged easily and can pose a risk of electrical shock, electrocution, or fire.

Lighting products that are excluded from the scope of the rule are subject to different voluntary standards or do not present the same risk of injury. Table 1 provides a non-exhaustive list of examples of lighting products that fall within, and outside of, the scope of the proposed rule.

Table 1: Seasonal and Decorative Lighting Products Within the Scope of the Draft Proposed Rule

In Scope: • Incandescent or LED light sets, 120 volts, cord-connected, either series or parallel wired, with either screw-in or mini-base push-in bulbs • Pre-lit artificial trees, wreaths, menorahs, lawn figures, light sculptures, and other decorative outfits and accessories incorporating light sets
Out of Scope: • Rope, tube, or tape lights without replaceable bulbs • Landscape lights or other permanent lighting devices, either assembled or unassembled • Battery-operated or transformer-connected light sets • Unlighted ornaments that replace a push-in mini-bulb

2. Applicable Voluntary Standard

UL 588-2000 is the current voluntary standard applicable to seasonal and decorative lighting products. UL 588 has been updated over the years to address various safety issues to make seasonal and decorative lighting products safer, *see* Staff's Briefing Package on Seasonal and Decorative Lighting Products, dated October 1, 2014 (Staff Briefing Package), Tab B, Abbreviated History of Seasonal and Decorative Lighting Products and the Associated UL Standard, at [insert URL]. Specifically, UL 588 made effective on January 1, 1997, the current requirements for overcurrent protection and minimum wire size, and the current strain relief requirement has been in effect since 1994. Table 2 summarizes the relevant sections and technical requirements in UL 588 for each of the three readily observable characteristics.

Table 2. Readily Observable Characteristics for Seasonal and Decorative Lighting Products

Seasonal and Decorative Lighting Products		Readily Observable Characteristics			
		Minimum Wire Size (AWG) *UL 588 Section 6*	Sufficient Strain Relief (load weight)		Overcurrent Protection Qty. *UL 588 Section 7*
			Plugs/Load Fittings *UL 588 Sections 15 and 71*	Lampholders *UL 588 Sections 79 and SB16*	
Series-connected lighting product	With Load Fitting	20 (Polarized Plug)	20 lbs. (smaller than 18 AWG)	24 lbs.	1
		22 (Non-Polarized Plug)		8 lbs.	2
	Without Load Fitting	22 (Polarized Plug)		8 lbs.	1
		22 (Non-Polarized Plug		8 lbs.	2
Parallel-connected light product	With or Without Load Fitting	20 (XTW) 18 (all others) All Polarized Plugs	20 lbs. (20 AWG) 30 lbs. (18 AWG)	24 lbs.	1

3. Electrocution and Fire Hazards

Consumers can be seriously injured or killed by electrical shocks or fires if seasonal and decorative lighting products are not made using minimum wire size, sufficient strain reliefs, or overcurrent protection. Lighting products that conform to the minimum wire size requirement in UL 588 will support the product's electrical load without causing overheating. Additionally, lighting products that conform to the minimum wire size requirement provide the necessary mechanical strength to endure handling and other forces imposed on a seasonal lighting product during expected use of the product. Likewise, lighting products that conform to the strain relief requirements in UL 588 will endure use, including pulling and twisting the product, without mechanical damage to the electrical connections. Damaged electrical connections, such as broken strands of copper conductor inside the insulated wiring, could cause overheating (leading to a fire), despite overcurrent protection, or separation of wires from their terminal connections, which could expose bare energized conductors leading to electrical shock. Finally, UL 588's requirements for overcurrent protection prevent products from overheating and melting due to faults, damage, or excessive loads. Such failures carry a potential risk of fire.

4. Risk of Injury

CPSC has been concerned with the number of fires and injuries resulting from seasonal and decorative lighting products for many years. From 1980 through 1997, CPSC received reports of 206 deaths and 808 nonfatal incidents involving seasonal and decorative lighting products that resulted in a fire and/or shock hazard. In a June 1995 report titled, "Electrical Holiday Lighting," CPSC staff cited annual averages of 500 fire service-attended fires and 30 deaths involving Christmas trees and another 68 fire deaths and shocks specifically related to electrical decorations.

More recently, staff's evaluation of the shock and fire hazard data related to seasonal and decorative lighting demonstrates that from 1980 through 2013, CPSC is aware of 132 fatal incidents, 256 deaths, and 1,255 non-fatal incidents associated with seasonal and decorative lighting products. Table 3 summarizes CPSC's injury data from 1980 through 2013, based on annual averages related to seasonal and decorative lighting products. Note that the average number of incidents and deaths has declined over the 33-year period represented in Table 3.

Table 3. Seasonal and Decorative Lighting Product Annual Average[1] of Fatal Incidents, Deaths, and Non-fatal Incidents from 1980 – 2013

Years	Fatal Incidents	Deaths	Non-fatal Incidents
1980–1986	6.7	12.6	54.1
1987–1993	6.3	13.6	40.9
1994–2000	2.9	5.9	37.4
2001–2007	2.1	3.6	32.6
2008−2013	1.0	1.2	16.7

5. Office of Compliance Efforts, to Date

In numerous instances, CPSC staff has considered the absence of one or more of the three readily observable characteristics (minimum wire size, sufficient strain relief, and overcurrent

[1] The numbers are given as annual averages instead of totals because there are four 7-year periods and one 6-year period.

protection) to present a substantial product hazard and has sought appropriate corrective action to prevent injury to the public. Since 1974, CPSC staff has conducted 47 voluntary recalls of seasonal and decorative lighting products, involving a total of 3.6 million units. *See* Tab D of Staff's Briefing Package, Seasonal and Decorative Lighting Product Recalls and Import Stoppages. In addition to product recalls, CPSC staff has stopped noncompliant seasonal and decorative lighting products at the ports at least 127 times, involving 31 companies and a total of about 200,000 lighting units. *Id*. Tables 1 and 2 in Tab D of the Staff's Briefing Package provide details on both voluntary recalls and import stoppages. Note that where the information is available, most of the hazards identified by staff in recalling or stopping seasonal and decorative lighting products would be deemed a substantial product hazard under the proposed rule.

Additionally, the Office of Compliance sent a letter dated July 14, 2014, to manufacturers, importers, distributors, and retailers of holiday lights and decorative products, informing them that the Office of Compliance considers products that do not conform to UL 588 regarding minimum wire size, sufficient strain relief, and overcurrent protection to be defective and to present a substantial product hazard. *See* Tab A of Staff's Briefing Package, Office of Compliance July 14, 2014 Letter to Manufacturers, Importers, and Retailers of Holiday Lights and Decorative Outfits.

II. Preliminary Determination of Substantial Product Hazard

A. Defined Characteristics Are Readily Observable

Sections 6, 7, 15, 71, 79, and SB16 of UL 588 set forth the requirements for the three readily observable characteristics in the proposed rule: minimum wire size, sufficient strain relief, and overcurrent protection. Table 2 in section I.B.2 of this Preamble summarizes the

technical requirements for the three readily observable characteristics in UL 588. Additionally, Tab C of the Staff's Briefing Package, Readily Observable Safety Characteristics of Seasonal and Decorative Lighting Products, provides more detail on the information presented in Table 2. If finalized, the rule would deem the absence of any one or more of these characteristics to be a substantial product hazard under section 15(a)(2) of the CPSA.

1. Minimum Wire Size

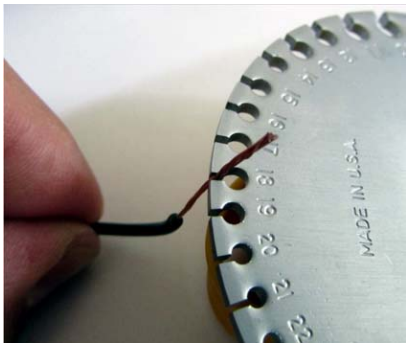
Section 6 of UL 588 requires that series-connected lighting products have a minimum wire size of 20 or 22 AWG, depending on whether the lighting product has a load fitting, and whether the plug is polarized. Parallel-connected lighting products must have a minimum wire size of 18 or 20 AWG, depending on the type of wire used in constructing the product. Whether a lighting product is series or parallel constructed, contains a load fitting, or has a polarized plug are all visually observable characteristics of seasonal and decorative lighting products. Pictures 1 and 2 show examples of series-connected and parallel-connected lighting products.

Picture 1: Series-connected miniature light string

Picture 2: Parallel-connected screw-base bulbs light string

Wire size is observable by a simple measurement of the bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. One method of measuring the exposed conductors is using a circular wire gauge, as shown in picture 3. In CPSC staff's experience, those lighting products that do not meet the minimum wire size

requirement typically fail by using wiring that is substantially undersized for the product, for example, more than six wire sizes smaller than the minimum required. Moreover, the act of exposing and measuring the wire in a seasonal and decorative lighting product is quickly and easily done by using a small, handheld device to strip the electrical insulation from the wiring. Accordingly, the Commission concludes preliminarily that minimum wire size, as required in section 6 of UL 588, is a readily observable characteristic of seasonal and decorative lighting products that can be observed visually by taking a simple measurement of the product's bare wire.



Picture 3: Measuring Wire Size (AWG) of Seasonal Light String

2. Sufficient Strain Relief

Sections 15, 71, 79, and SB16 of UL 588 set forth the requirements for sufficient strain relief in seasonal and decorative lighting products. Strain relief is observed in several locations: at the plugs and load fittings, as well as at the lampholders. Pursuant to UL 588, sufficient strain relief is observed by suspending a gradually applied straight pull on the wiring by use of a suspended weight for 60 seconds. During that time, wires with sufficient strain relief will not pull loose or stretch from the lampholder, plug, or load fitting being tested. Picture 4 demonstrates observation of sufficient strain relief on a plug.

Picture 4: Observation of Strain Relief on a Plug

The applicable weight required in UL 588 to be suspended from the lighting product depends on its configuration. Section 15 of UL 588 describes the general requirements that strain relief must be provided on the electrical connection used in seasonal and decorative lighting products. Sections 71, 79, and SB16 of UL 588 describe the specific requirements. Section 71 of UL 588 requires that series-connected plugs and load fittings be subjected to a 20-lb. weight. For parallel-connected lighting products, plugs and load fittings for products with wires smaller than 18 AWG must be subjected to a 20-lb. weight, and products with wires 18 AWG or larger must be subjected to a 30-lb. weight. Similarly, sections 79 and SB16 of UL 588 specify applicable weights to observe sufficient strain relief in lampholders. For series-connected lighting products, if the wires are smaller than 20 AWG, the weight applied must be a minimum of 8 lbs., and if the wires are 20 AWG or larger, the weight applied must be a

minimum of 24 lbs. For parallel-connected lampholders, if the wires are 20 AWG or larger, the weight applied must be a minimum of 24 lbs. The applicable weights are summarized in Table 2 in section I.B.2 of this Preamble.

The strain relief portion of UL 588 for seasonal and decorative lighting products is observable visually by hanging a weight on the light string for 60 seconds and observing whether the weight drops or stretches the wiring. In CPSC staff's experience, lighting products that fail the strain relief requirements in UL 588 do so immediately or within a few seconds of suspending the applicable weight. The Commission concludes preliminarily that sufficient strain relief, as required in sections 15, 71, 79, and SB16 of UL 588, is a readily observable characteristic of seasonal and decorative lighting products that can be determined by suspending the applicable weight from the plug, load fitting, or lampholder, and by observing visually whether the wire breaks or stretches.

3. Overcurrent Protection

Section 7 of UL 588 specifies overcurrent protection for every seasonal and decorative lighting product. Lighting products must contain at least one fuse if the plug is polarized (parallel-connected strings must have a polarized plug) or two fuses if the plug is not polarized.

A seasonal light string with overcurrent protection is readily observable by the presence of a fuse holder located in the plug or near the plug, and observing the presence of a fuse by opening the fuse holder. Picture 5 depicts a light string with a plug containing the fuses required by UL 588. The Commission concludes preliminarily that overcurrent protection, as required in section 7 of UL 588, is a readily observable characteristic of seasonal and decorative lighting products that can be determined by a visual observation of whether the lighting product has a fuse holder containing the correct number of fuses.

Picture 5: Fuse

B. Conformance to UL 588 Has Been Effective in Reducing the Risk of Injury

The Commission finds preliminarily that conformance to sections 6, 7, 15, 71, 79, and SB16 of UL 588, as summarized in Table 2 in section I.B.2 of this Preamble, has been effective in reducing the risk of injury from shock and fire associated with below-minimum wire size, insufficient strain relief, and lack of overcurrent protection. Additionally, CPSC's incident data suggest that conformance to UL 588 has contributed to a decline in the risk of injury associated with seasonal and decorative lighting products. *See* Tab E of Staff's Briefing Package, Seasonal Lighting and Decorative Products: Fire or Shock Incidents from 1980 to 2013.

If incandescent light strings last approximately three seasons of use,[2] then it can be expected that product changes made to conform to new requirements in UL 588 would be evident within a period of time thereafter. On January 1, 1997, UL 588's requirements for overcurrent protection and minimum wire size took effect; and the current strain relief requirement has been in effect since 1994. Table 4 lists the deaths associated with seasonal and decorative lighting products for the periods 1980−1996 and 2000−2013. The years from 1997 to 1999 would have been transitional years, where older products in consumer homes were being replaced with light strings incorporating the January 1, 1997 changes (minimum wire size and overcurrent protection) in the UL standard. The average number of deaths per year and the average number of nonfatal incidents per year were higher before 1997, and the numbers dropped after 1999.

[2] Incandescent light strings advertise that the products have a usual design life span of approximately 1,500 hours. Using an average of 12 hours per day for 40 days per year, incandescent light strings last approximately 3 years.

Table 4: Deaths Associated with Seasonal and Decorative Lighting Products

Period	1980–1996	2000−2013
Deaths	202	43
Nonfatal Incidents	762	366
Average Deaths per year	11.88	3.07
Average Nonfatal Incidents per year	44.82	26.14

Figure 1 presents a 3-year moving average for deaths due to seasonal and decorative lighting products, by year, for the period 1980−2013 for data from the Potential Injury Database (IPII), National Electronic Injury Surveillance System (NEISS), and the Death Certificate Database (DTHS). Figure 1 shows that the number of deaths started to decline as early as 1990, and continued on a downward trend to 2013, with the exceptions of yearly fluctuations. This early decrease may be due to various factors, such as changes to UL 588, home building codes, and fire-prevention strategies. Since 2004, the continuation of low death rates is partially attributed to the construction and performance requirements in the current UL 588 standard.

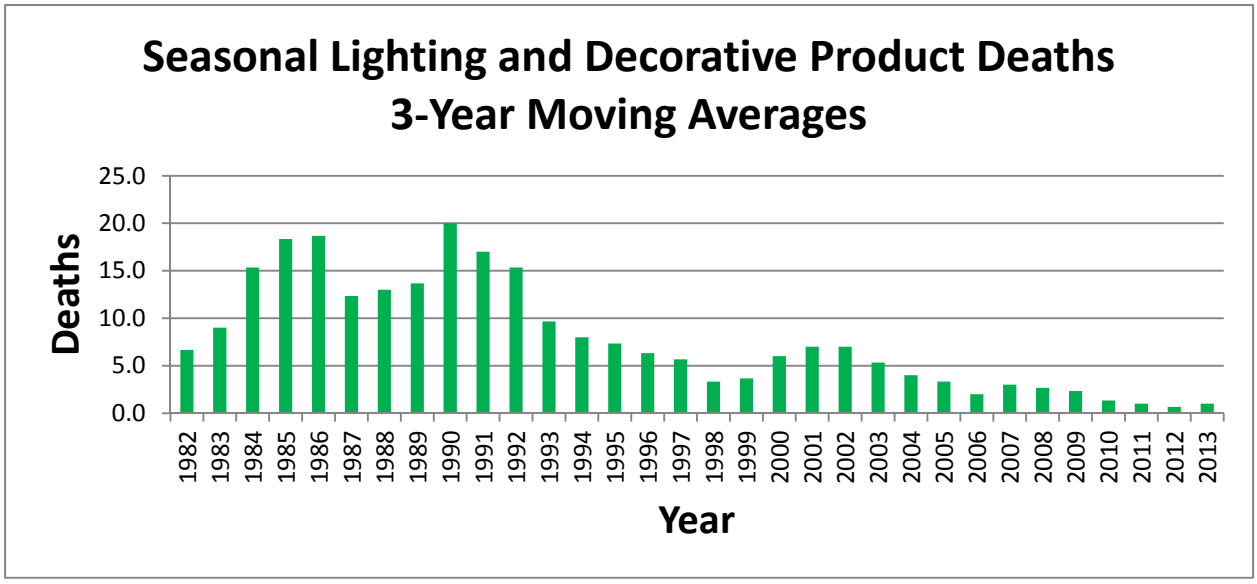


Figure 1. Three-Year Moving Averages of Seasonal Lighting and Decorative Product Deaths from 1980 to 2013[3]

[3] Incident data is from Potential Injury Database (IPII), National Electronic Injury Surveillance System (NEISS), and the Death Certificate Database (DTHS).

Figure 2 presents a 3-year moving average for nonfatal incidents due to seasonal and decorative lighting products, by year, for the period 1980−2013 for data from IPII and NEISS. Figure 2 also demonstrates an overall downward trend to 2013, with the exceptions of yearly fluctuations. The decrease can be attributed to several factors, including: changes to UL 588, home building code, and fire prevention strategies. However, the construction and performance requirements in the current UL 588 standard for seasonal and decorative lighting products with minimum wire size, sufficient strain relief, and overcurrent protection have made the products safer than products manufactured without these construction and performance requirements.

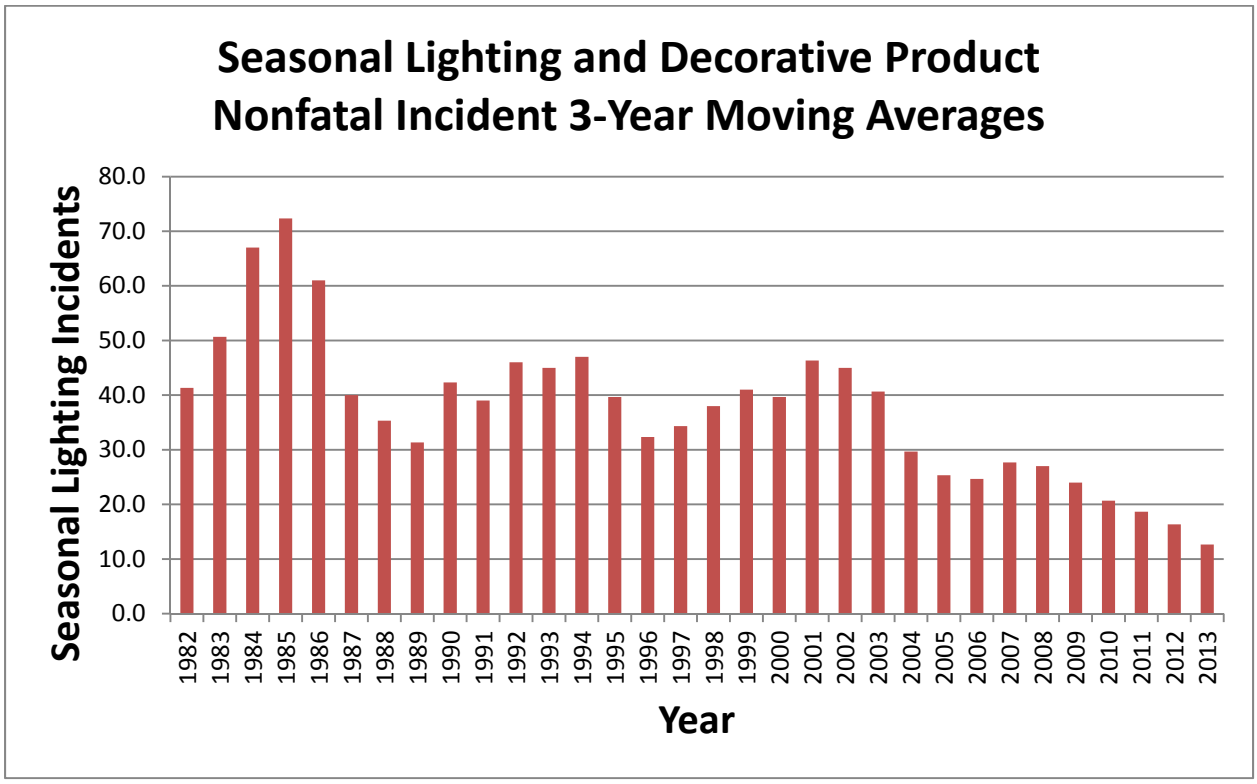


Figure 2. Three-Year Moving Averages of Seasonal Lighting and Decorative Product Nonfatal Incidents from 1980 to 2013[2]

C. Lighting Products Substantially Comply with UL 588

The CPSA does not define "substantial compliance" with a voluntary standard. Legislative history of the CPSA regarding a finding of "substantial compliance" in the context of

issuing a consumer product safety standard indicates that substantial compliance should be measured by considering the number of complying products, rather than the number of manufacturers of products that comply with a standard. H.R. Rep. No. 208, 97th Cong., 1st Sess. 871 (1981). This same legislative history indicates further that substantial compliance may be found when an unreasonable risk of injury associated with a product will be eliminated or adequately reduced "in a timely fashion." *Id*. The Commission has not articulated a bright line rule for substantial compliance. Rather, in the rulemaking context, the Commission has stated that the determination of substantial compliance should be made on a case-by-case basis.

The Commission finds preliminarily that compliance with UL 588 is "substantial" as that term is used in section 15(j) of the CPSA. The Commission's preliminary finding is based on CPSC staff's review of market information and compliance activity, and staff's estimate that a majority of seasonal and decorative lighting products, well in excess of 90 percent, sold for consumer use in the United States, likely conforms to UL 588. S*ee* Tab F of Staff's Briefing Package, Conformance to UL Voluntary Standard for Seasonal and Decorative Lighting Products.

The U.S. Department of Homeland Security's Customs and Border Patrol (CBP) reported that in 2013, the import value of products that would be covered by the draft proposed rule was about $500 million, comprised of roughly 20,000 "entries" or product shipments. If the average import value per unit were $5.00 (based on the range of retail prices observed by staff), then the number of units imported annually may be up to 100 million. CBP also reported that about 550 firms were engaged in the importation of seasonal and decorative lighting products during 2013. Adjusting to exclude shipping companies and other third parties, the total number of firms importing seasonal and decorative lighting products into the United States was probably about

500, with the largest number of shipments originating from the People's Republic of China. An online, wholesale directory identified about 160 manufacturers and suppliers in China, Hong Kong, and Taiwan, with about 120 of these exporting products to the United States. Another online product directory identified more than 2,000 individual models of products from manufacturers located in China.

For purposes of this analysis, the Commission considers all seasonal and decorative lighting products carrying a listing or certification mark from UL, Intertek Company (ETL), or the CSA Group (CSA) to be in conformance with the requirements of UL 588. Staff's Internet search of online catalogs, demonstrates that all of the 20 to 30 major national brands, which probably account for a majority of all units sold, consist only of conforming products because they are labeled as UL, ETL, or CSA compliant. Major retailers also often specify conforming products. Although CPSC recalls and import stoppages involve a very small percentage of product units in commerce, available CPSC data on recalls and import stoppages over the past decade suggest a very low (less than 1 percent) incidence of defects and nonconformance. The Commission finds that all of these factors indicate that conformance with UL requirements is very high, and estimates that voluntary conformance with UL 588 is in excess of 90 percent of all units.

III. Description of the Proposed Rule

The proposed rule would create two new paragraphs in part 1120. Proposed § 1120.2(d) would define a "seasonal and decorative lighting product" as:

> Portable, plug-connected, temporary-use lighting products and accessories that have a nominal 120 volt input voltage rating. Lighting products within the scope of the rule are factory-assembled with push-in, midget- or miniature-screw base

lampholders connected in series or with candelabra- or intermediate-screw base lampholders connected in parallel, directly across the 120 volt input. Such lighting products include lighted decorative outfits, such as stars, wreathes, candles without shades, light sculptures, blow-molded (plastic) figures, and animated figures. Lighting products outside the scope of the rule include: battery-operated products; products that operate from a transformer or low-voltage power supply; flexible tube lighting strings of lights intended for illumination; and portable electric lamps that are used to illuminate seasonal decorations.

This definition is adapted from descriptions of lighting products defined in section 1 of UL 588. Lighting products within the scope of the rule are typically used seasonally (temporarily) and provide only decorative lumination. The products typically are displayed for a relatively short period of time and then removed and stored until needed again. Lighting products that are excluded from the scope of the rule are subject to different voluntary standards or do not present the same risk of injury.

Proposed § 1120.3(d) would state that seasonal and decorative lighting products that do not conform to one or more of the following characteristics required in sections 6, 7, 15, 71, 79, and SB16 of UL 588 (explained in more detail in sections I.B.2 (Table 2) and II.A of this Preamble) are deemed substantial product hazards under section 15(a)(2) of the CPSA:

(1) minimum wire size requirements in section 6 of UL 588;

(2) sufficient strain relief requirements in sections 15, 71, 79, and SB16 of UL 588; or

(3) overcurrent protection requirements in section 7 of UL 588.

IV. Effect of the Proposed 15(j) Rule

Section 15(j) of the CPSA allows the Commission to issue a rule specifying that a consumer product or class of consumer products has characteristics whose presence or absence creates a substantial product hazard. If a final rule is issued under section 15(j) of the CPSA, such a rule would not be a consumer product safety rule, and thus, would not create a mandatory standard that triggers testing or certification requirements under section 14(a) of the CPSA.

Although a rule issued under section 15(j) of the CPSA is not a consumer product safety rule, placing a consumer product on the substantial product hazard list in 16 CFR part 1120 would have certain ramifications. A product that is or has a substantial product hazard is subject to the reporting requirements of section 15(b) of the CPSA, 15 U.S.C. 2064(b). A manufacturer, importer, distributor, or retailer that fails to report a substantial product hazard to the Commission is subject to civil penalties under section 20 of the CPSA, 15 U.S.C. 2069, and possibly to criminal penalties under section 21 of the CPSA, 15 U.S.C. 2070.

A product that is or contains a substantial product hazard is also subject to corrective action under sections 15(c) and (d) of the CPSA, 15 U.S.C. 2064(c) and (d). Thus, if a final rule is issued under section 15(j) for seasonal and decorative lighting, the Commission could order the manufacturer, importer, distributor, or retailer of lighting products that do not contain one or more of the three readily observable characteristics to offer to repair or replace the product, or to refund the purchase price to the consumer.

A product that is offered for import into the United States and is or contains a substantial product hazard shall be refused admission into the United States under section 17(a) of the CPSA, 15 U.S.C. 2066(a). Additionally, CBP has the authority to seize certain products offered for import under the Tariff Act of 1930 (19 U.S.C. 1595a) (Tariff Act), and to assess civil

penalties that CBP, by law, is authorized to impose. Section 1595a(c)(2)(A) of the Tariff Act states that CBP may seize merchandise, and such merchandize may be forfeited if: "its importation or entry is subject to any restriction or prohibition which is imposed by law relating to health, safety, or conservation and the merchandise is not in compliance with the applicable rule, regulation, or statute."

V. Regulatory Flexibility Act Analysis

The Regulatory Flexibility Act (RFA) requires that proposed rules be reviewed for the potential economic impact on small entities, including small businesses. 5 U.S.C. 601-612. Section 603 of the RFA requires agencies to prepare and make available for public comment an Initial Regulatory Flexibility Analysis (IRFA), describing the impact of the proposed rule on small entities and identifying impact-reducing alternatives. For the reasons that follow, the Commission concludes that the proposed rule will not have a significant impact on a substantial number of small entities.

Based on staff's review of information on importers, of the roughly 500 companies that import seasonal and decorative lighting products in the United States, staff estimates that 400 to 450 would be considered small firms under the U.S. Small Business Administration's size guidelines. CPSC staff estimates that a very high percentage, probably well in excess of 90 percent of products that would be subject to a rule, already conform to UL 588. Importers, distributors, and retailers that market only UL 588-conforming products would not be affected. Staff has observed that small importers, distributors, and retailers of nonconforming light sets generally market other related products as well. The sales revenue of these small firms is not solely dependent on seasonal lighting products. Thus, income for these small firms would not be affected significantly, and, except for the nonconforming light sets, product lines would not be

curtailed significantly. Furthermore, the draft proposed rule represents a continuation of the existing practice of the CPSC's Office of Compliance and Field Operations to designate nonconforming seasonal lighting products as a substantial product hazard.

VI. Environmental Considerations

Generally, the Commission's regulations are considered to have little or no potential for affecting the human environment, and environmental assessments and impact statements are not usually required. *See* 16 CFR 1021.5(a). The proposed rule to deem seasonal and decorative lighting products that do not contain one or more of three readily observable characteristics to be a substantial product hazard is not expected to have an adverse impact on the environment and is considered to fall within the "categorical exclusion" for the purposes of the National Environmental Policy Act. 16 CFR 1021.5(c).

VII. Paperwork Reduction Act

The proposed rule does not require any stakeholder to create, maintain, or disclose information. Thus, no paperwork burden is associated with the proposed rule, and the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520) does not apply.

VIII. Preemption

The proposed rule under section 15(j) of the CPSA would not establish a consumer product safety rule. Accordingly, the preemption provisions in section 26(a) of the CPSA, 15 U.S.C. 2075(a), would not apply to this rule.

IX. Effective Date

The Administrative Procedure Act (APA) generally requires that the effective date of a rule be at least 30 days after publication of a final rule. 5 U.S.C. 553(d). The Commission proposes that any seasonal and decorative lighting product that does not conform to sections 6, 7,

15, 71, 79, and SB16 of UL 588 with regard to minimum wire size, sufficient strain relief, and overcurrent protection is deemed a substantial product hazard effective 30 days after publication of a final rule in the *Federal Register*. After that date, all seasonal and decorative lighting products that are subject to, but do not comply with, UL 588 with respect to minimum wire size, sufficient strain relief, or overcurrent protection, will be deemed to be a substantial product hazard, regardless of the date such products were manufactured or imported. The Commission believes that a 30-day effective date is appropriate because:

- seasonal and decorative lighting products are already in substantial conformance with UL 588;
- the requirements for the readily observable characteristics from UL 588 in the proposed rule (wire size, strain relief, and overcurrent protection) have been in effect as a voluntary standard since the 1990s, and are well-known;
- the Office of Compliance sent a letter dated July 14, 2014, to manufacturers, importers, and retailers of holiday lights and decorative outfits, informing them that the Office of Compliance considers products that do not conform to UL 588, regarding minimum wire size, sufficient strain relief, and overcurrent protection, to be defective and present a substantial product hazard; and
- importers can substitute conforming products, if necessary, before a final rule becomes effective.

Based on the available information, the Commission concludes that a 30-day effective date would not likely result in significant impacts on industry or disrupt the supply of conforming products.

X. Request for Comments

The Commission invites interested persons to submit their comments to the Commission on any aspect of the proposed rule. Comments should be submitted as provided in the instructions in the ADDRESSES section at the beginning of this notice.

List of Subjects in 16 CFR Part 1120

Administrative practice and procedure, Clothing, Consumer protection, Household appliances, Lighting, Infants and children, Imports, Incorporation by reference.

For the reasons stated above, and under the authority of 15 U.S.C. 2064(j), 5 U.S.C. 553, and section 3 of Public Law 110-314, 122 Stat. 3016 (August 14, 2008), the Consumer Product Safety Commission proposes to amend 16 CFR part 1120 as follows:

PART 1120 – SUBSTANTIAL PRODUCT HAZARD LIST

1. In § 1102.2, add paragraph (d) to read as follows:

§ 1120.2 Definitions.

* * * * *

(d) *Seasonal and decorative lighting product* means portable, plug-connected, temporary-use lighting products and accessories that have a nominal 120 volt input voltage rating. Lighting products within the scope of the rule are factory-assembled with push-in, midget- or miniature-screw base lampholders connected in series or with candelabra- or intermediate-screw base lampholders connected in parallel, directly across the 120 volt input. Such lighting products include lighted decorative outfits, such as stars, wreathes, candles without shades, light sculptures, blow-molded (plastic) figures, and animated figures. Lighting products outside the scope of the rule include: battery-operated products; products that operate from a transformer or

low-voltage power supply; flexible tube lighting strings of lights intended for illumination; and portable electric lamps that are used to illuminate seasonal decorations.

2. In § 1120.3, add paragraph (c) to read as follows:

§ 1120.3 Substantial product hazard list.

* * * * *

(c) Seasonal and decorative lighting products that lack one or more of the following characteristics in conformance with requirements in sections 6, 7, 15, 71, 79, and SB16 of Underwriters Laboratories (UL) *Standard for Safety for Seasonal and Holiday Decorative Products,* UL 588, 18th Edition, approved August 21, 2000 (UL 588):

(1) minimum wire size requirements in section 6 of UL 588;

(2) sufficient strain relief requirements in sections 15, 71, 79, and SB16 of UL 588; or

(3) overcurrent protection requirements in section 7 of UL 588.

The Director of the Federal Register approves the incorporations by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy from UL, Inc., 333 Pfingsten Road, Northbrook, IL 60062. You may inspect a copy at the Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone 301-504-7923, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal-register/cfr/ibr-locations.html.

Dated: _____

_____
Todd A. Stevenson,
Secretary, Consumer Product Safety Commission.

Staff Briefing Package

Seasonal and Decorative Lighting Products
October 2, 2014

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Briefing Memorandum: Substantial Product Hazards Posed by Seasonal and Decorative Lighting Products: Staff's Recommended Draft Proposed Rule under Section 15(j) of the Consumer Product Safety Act

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

This document has been electronically approved and signed.

MEMORANDUM

Date: October 2, 2014

TO : The Commission
Todd Stevenson, Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director
Robert J. Howell, Deputy Executive Director for Safety Operations

FROM : George A. Borlase, Ph.D., P.E.
Assistant Executive Director
Office of Hazard Identification and Reduction

Arthur S. Lee
Office of Hazard Identification and Reduction

SUBJECT : Substantial Product Hazards Posed by Seasonal and Decorative Lighting Products: Staff's Recommended Draft Proposed Rule under Section 15(j) of the Consumer Product Safety Act

The U.S. Consumer Product Safety Commission (CPSC, Commission) is considering a possible rule for seasonal and decorative lighting products. CPSC staff recommends that the Commission publish staff's draft proposed rule to deem the absence of one or more of three readily observable characteristics associated with these products a "substantial product hazard" (SPH), as authorized under section 15(j) of the Consumer Product Safety Act (CPSA). These observable characteristics are embodied in an existing voluntary standard, Underwriters Laboratories (UL) *Standard for Safety for Seasonal and Holiday Decorative Products,* UL 588, 18th Edition, approved August 21, 2000 (UL 588).[1] This briefing package presents the basis for staff's recommendation.

I. Introduction

The Consumer Product Safety Improvement Act of 2008 (CPSIA)[2] expanded section 15 of the CPSA by creating a new subsection (j) that allows the Commission to specify by rule for a consumer product, or class of consumer products, characteristics whose existence or absence the Commission deems present a substantial product hazard, as defined in section 15(a)(2) of the CPSA. To deem the presence or absence of characteristics an SPH:

[1] The UL mark and logo are trademarks of UL, Inc. (formerly known as Underwriters Laboratories, Inc.).
[2] Pub. L. No. 110-314.

- the characteristics must be "readily observable";
- the characteristics must be addressed by a voluntary standard;
- the voluntary standard must be effective at reducing the risk of injury; and
- there must be substantial compliance with the voluntary standard.

Throughout the agency's history, CPSC staff has been active in addressing fire and electrocution risks associated with seasonal and decorative lighting products. In preliminary hazard determinations, CPSC staff, on a number of occasions, has identified seasonal and decorative lighting products without: (1) minimum wire size, (2) sufficient strain relief, or (3) overcurrent protection, and considered such products to present an SPH. All three of these characteristics can be readily observed by CPSC staff. The applicable voluntary safety standard, UL 588, requires a minimum wire size, sufficient strain relief, and overcurrent protection. These requirements have been effective in reducing the risk of injury from fire and electrocution. CPSC's incident data suggest that UL 588 has contributed to a decline in the risk of injury associated with seasonal and decorative lighting products. Moreover, the CPSC's Directorate for Economic Analysis estimates that at least 90 percent of the seasonal and decorative lighting products sold in the United States comply with UL 588. Accordingly, CPSC staff concludes that all of the criteria required for inclusion of seasonal and decorative lighting products on the SPH list under section 15(j) of the CPSA have been met.

Although a rule issued under section 15(j) of the CPSA is not a consumer product safety rule, such a rule would constitute a Commission determination of an SPH. Such a determination creates clarity for consumers and for industry regarding what the Commission considers to be a hazard associated with seasonal and decorative lighting products. For example, a product that is or has an SPH is subject to the reporting requirements of section 15(b) of the CPSA, 15 U.S.C. 2064(b). A manufacturer, importer, distributor, or retailer who fails to report a substantial product hazard to the Commission is subject to civil penalties, and possibly, to criminal penalties.

In addition to creating clarity for stakeholders, a Commission specification by rule of an SPH creates enforcement efficiencies for the CPSC. For example, a product that is or contains an SPH is subject to corrective action. The Commission could order the manufacturer, importer, distributor, or retailer of nonconforming lighting products to offer to repair or replace the product or to refund the purchase price to the consumer. Additionally, CPSC can refuse admission of nonconforming products offered for import, or CPSC can request U.S. Customs and Border Protection (CBP) to seize nonconforming lighting products under its authority pursuant to the Tariff Act of 1930 (19 U.S.C. 1595a).

II. Proposed Definition of Seasonal and Decorative Lighting Products

Staff's draft proposed rule uses the phrase "seasonal and decorative lighting products" to identify the lighting products that are within the scope of the proposed rule. Staff proposes that the definition of "seasonal and decorative lighting products," for purposes of the draft proposed rule, be consistent with the description of products defined in section 1 of UL 588, but to exclude a subset of products that do not pose the same risk of fire or electrocution. Accordingly, "seasonal and decorative lighting products" are defined in the draft proposed rule as:

Portable, plug-connected, temporary-use lighting products and accessories that have a nominal 120 volt input voltage rating. Lighting products within the scope of the rule are factory-assembled with push-in, midget- or miniature-screw base lampholders connected in series or with candelabra- or intermediate-screw base lampholders connected in parallel, directly across the 120 volt input. Such lighting products include lighted decorative outfits, such as stars, wreathes, candles without shades, light sculptures, blow-molded (plastic) figures, and animated figures. Lighting products outside the scope of the rule include: battery-operated products; products that operate from a transformer or low-voltage power supply; flexible tube lighting strings of lights intended for illumination; and portable electric lamps that are used to illuminate seasonal decorations.

This definition of "seasonal and decorative lighting products" is adapted from descriptions of lighting products defined in section 1 of UL 588. Figure 1 depicts products within the scope of the rule. Lighting products within the scope of the rule are typically used seasonally and provide only decorative lumination. The products typically are displayed for a relatively short period of time and then removed and stored until needed again. UL 588 defines "seasonal" as temporary installation and use, customarily for less than 90 days. UL 588 section 2.43 defines the term "seasonal (holiday) product" as "[a] product painted in colors to suggest a holiday theme or a snow covering, a figure in a holiday costume, or any decoration associated with a holiday or particular season of the year." UL 588 defines "decorative light products" (decorative outfits) as factory-assembled, electrically powered units providing a seasonal or holiday decorative display having illumination or other decorative effects. A decorative product may contain a lighting string as part of the decorative illumination. A lighting string provided with decorative covers over the lamps is a decorative outfit. If not constructed properly, lighting powered by 120 volts can be damaged easily and can pose a risk of electrical shock, electrocution, or fire.

Seasonal lighting with screw base lampholders

Seasonal lighting with miniature push-in lampholders

Figure 1. Seasonal Lighting Products

All in-scope products are covered by UL 588. Various subsets of products would be included in or excluded from the scope of the rule. Table 1 provides a non-exhaustive list of examples of lighting products that fall within and out of scope of the proposed rule. The products that are out of scope for the draft proposed rule are not subject to UL 588, or do not present the same risks of injury.

Table 1: Seasonal and Decorative Lighting Products Within the Scope of the Draft Proposed Rule

In Scope: • Incandescent or LED light sets, 120 volts, cord-connected, either series or parallel wired, with either screw-in or mini-base push-in bulbs • Pre-lit artificial trees, wreaths, menorahs, lawn figures, light sculptures, and other decorative outfits and accessories incorporating light sets
Out of Scope: • Rope, tube, or tape lights without replaceable bulbs • Landscape lights or other permanent lighting devices, either assembled or unassembled • Battery-operated or transformer-connected light sets • Unlighted ornaments that replace a push-in mini-bulb

III. Substantial Product Hazards Associated with Seasonal and Decorative Lighting Products

Section 15(a)(2) of the CPSA defines an SPH, in relevant part, as a product defect, which (because of the pattern of defect, the number of defective products distributed in commerce, the severity of the risk, or otherwise) creates a substantial risk of injury to the public. To address effectively the risk of injury from fire and electrocution, CPSC staff has identified three readily observable safety characteristics of seasonal and decorative lighting products. The absence of any one or more of these characteristics presents an SPH, including electrical shock and fire hazards:

- minimum wire size,
- sufficient strain relief, or
- overcurrent protection.

Each of these characteristics is addressed in more detail below.

Consumers can be seriously injured or killed by electrical shocks or fires if seasonal and decorative lighting products are not constructed using minimum wire size, sufficient strain reliefs, or overcurrent protection. Conforming to the minimum wire size requirement in UL 588 supports a lighting product's electrical load without causing overheating. Additionally, conforming to the minimum wire size requirement provides the necessary mechanical strength to endure handling and other forces imposed on a seasonal lighting product during expected use of the product. Likewise, conforming to the strain relief requirements in UL 588 ensures that use of seasonal and decorative lighting products, including pulling and twisting the product, does not cause mechanical damage to the connections. Damaged connections, such as broken strands of copper wiring inside the insulated wiring, could cause overheating (leading to a fire), despite overcurrent protection, or separation of wires from their terminal connections, which could expose bare energized conductors leading to electrical shock. Finally, lighting products that conform to UL 588's requirements for overcurrent protection prevent products from overheating and melting due to faults, damage, or excessive loads. Such failures carry a potential risk of fire.

In numerous instances, CPSC staff has considered the absence of one or more of the three readily observable characteristics described in section IV to present an SPH and has sought appropriate corrective action to prevent injury to the public. Since 1974, CPSC staff has conducted 47 voluntary recalls of seasonal and decorative lighting products, involving a total of 3.6 million units. *See* Tab D, Seasonal and Decorative Lighting Product Recalls and Import Stoppages. In addition to product recalls, CPSC staff identified 127 import stoppages involving a total of nearly 200,000 lighting units. *See* Tab D, Tables 1 and 2. Note that where the information is available, most of the hazards listed in Tables 1 and 2 of Tab D, for which staff made an SPH preliminary determination, would be considered readily observable characteristics under the draft proposed rule, and such nonconformance would constitute an SPH.

Additionally, the Office of Compliance sent a letter dated July 14, 2014, to manufacturers, importers, and retailers of holiday lights and decorative products, informing them that the Office of Compliance considers products that do not conform to UL 588, regarding minimum wire size, sufficient strain relief, and overcurrent protection, are defective and present an SPH. *See* Tab A, Office of Compliance July 14, 2014 Letter to Manufacturers, Importers, and Retailers of Holiday Lights and Decorative Outfits.

IV. Minimum Wire Size, Sufficient Strain Relief, and Overcurrent Protection Are Readily Observable Safety Characteristics

UL 588 requires a minimum wire size, sufficient strain relief, and overcurrent protection for seasonal and decorative lighting products. CPSC staff believes that such characteristics are readily observable by: measuring the total size of the conductors in the wiring, measuring sustainable force on the wiring at the lampholders and plugs/load fittings, and the presence of fuse(s) in the plug or in-line fuse. Table 2 lists the characteristics associated with series-connected and parallel-connected lighting products. *See* Tab C, Readily Observable Safety Characteristics of Seasonal and Decorative Lighting Products.

Table 2. Readily Observable Characteristics for Seasonal and Decorative Lighting Products

Seasonal and Decorative Lighting Products		Readily Observable Characteristics			
		Minimum Wire Size (AWG) *UL 588 Section 6*	Sufficient Strain Relief (load weight)		Overcurrent Protection Qty. *UL 588 Section 7*
			Plugs/Load Fittings *UL 588 Sections 15 and 71*	Lampholders *UL 588 Sections 79 and SB16*	
Series-connected lighting product	With Load Fitting	20 (Polarized Plug)	20 lbs. (smaller than 18 AWG)	24 lbs.	1
		22 (Non-Polarized Plug		8 lbs.	2
	Without Load Fitting	22 (Polarized Plug)		8 lbs.	1
		22 (Non-Polarized Plug		8 lbs.	2
Parallel-connected light product	With or Without Load Fitting	20 (XTW) 18 (all others) All Polarized Plugs	20 lbs. (20 AWG) 30 lbs. (18 AWG)	24 lbs.	1

A. Minimum Wire Size Is Readily Observable

Section 6.1 of UL 588, Tables 6.1 and 6.2, specifies the conductor types and minimum wire sizes that are required for seasonal lighting products. For series-connected (miniature) light strings, UL 588 specifies the minimum wire size to be 22 AWG or 20 AWG, depending on the light string configuration/construction. For parallel-connected (screw-base bulbs) light strings, UL 588 specifies the minimum wire size to be 20 AWG or 18 AWG, depending on the light string configuration/construction.

Wire size is observable by a simple measurement of the bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. The act of exposing the wire is done quickly and easily by using a small, handheld device used to strip the electrical insulation from the wiring. One method of measuring the exposed conductors is using a circular wire gauge. Figure 1 demonstrates this method. In this example, the 18 AWG wire passes through the 18 AWG slot but not through any of the thinner (numerically larger) AWG slots. In CPSC staff's experience, lighting products that do not meet the minimum wire size requirement typically fail by using wiring that is substantially undersized for the product, for example, products that use wiring that is more than six wire sizes smaller than the minimum required.

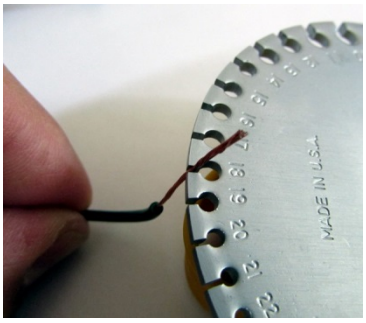
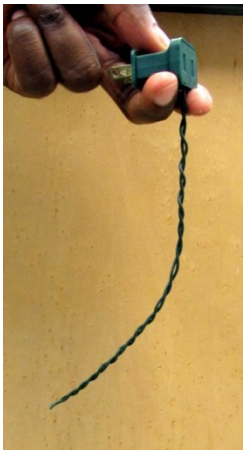


Figure 1: Measuring Wire Size

B. Sufficient Strain Relief Is Readily Observable

Section 15 of UL 588 describes the general requirement that strain relief must be provided on the electrical connection used in seasonal and decorative lighting products. Sections 71, 79, and SB16 of UL 588 describe the specific requirements to measure proper strain relief for both lampholders (where a light is attached to a wire) and plugs/load fittings. Series-connected lampholders and plugs/load fittings must be subjected to a gradually applied straight pull on the wiring by use of a suspended weight or tension force for 60 seconds. During the 60 seconds, the wire must not pull loose or stretch from the plug/load fitting. Sections 79 and SB16 of UL 588 require a minimum of 8 lb.- or 24 lb.-weight suspension to observe sufficient strain relief for lampholders, depending on the wire size and light string configuration. Section 71 of UL 588 requires a 20 lb.- or 30 lb.-weight suspension to observe sufficient strain relief for plugs/load fittings, depending on the wire size and light string configuration. Thus, sufficient strain relief is observable by looking at a lampholder and plug/load fitting's ability to hold a specified weight for 60 seconds. Figure 2 depicts one method of applying a constant weight to the plug or lampholder. In CPSC staff's experience, a lighting product with insufficient strain relief will typically fail this test immediately, or within a few seconds of suspending the applicable weight.

Plug Test



Failed Strain Relief Test on the Plug

Lampholder Test

Figure 2: Strain Relief

C. Overcurrent Protection Is Readily Observable

Section 7 of UL 588 specifies overcurrent protection for every seasonal and decorative lighting product to contain at least one fuse if the plug is polarized (parallel-connected strings must have a polarized plug), or two fuses if the plug is not polarized. A seasonal light string with overcurrent protection is readily observable by the presence of the fuse holder located in the plug or near the plug and observing the presence of a fuse by opening the fuse holder. Figure 3 depicts a light string with a plug containing the fuses required by UL 588.

Figure 3: Two Fuses used for Overcurrent Protection

V. The Need for Minimum Wire Size, Sufficient Strain Relief, and Overcurrent Protection Is Addressed by the Voluntary Standard

Consumers can be seriously injured or killed if seasonal and decorative lighting products are not made using minimum wire size, sufficient strain reliefs, or overcurrent protection. CPSC staff has been concerned with the number of fires and injuries resulting from seasonal and decorative lighting products for many years. From 1980 through 1997, CPSC received reports of 206 deaths and 808 nonfatal incidents involving seasonal and decorative lighting products that resulted in a fire and/or shock hazard. In a June 1995 report titled, "Electrical Holiday Lighting," CPSC staff cited annual averages of 500 fire service-attended fires and 30 deaths involving Christmas trees and another 68 fire deaths and shocks specifically related to electrical decorations.

UL 588 has been updated over the years to address various safety issues to make seasonal and decorative lighting products safer, *see* Tab B, Abbreviated History of Seasonal and Decorative Lighting Products and the Associated UL Standard. For example, in the mid 1980s, UL 588 added an overcurrent protection requirement. Such requirement has been a contributing factor to the observed gradual decline in fatalities since 1990. UL 588 made effective on January 1, 1997, the current requirements for overcurrent protection and minimum wire size; and the current strain relief requirement has been in effect since 1994. UL 588 has been effective in reducing the risk of injury from shock and fire associated with below-minimum wire size, insufficient strain relief, and lack of overcurrent protection. After the 1997 changes to the UL 588 standard, the annual average deaths and the nonfatal incidents involving seasonal and decorative lighting products declined, as shown in the next section.

VI. UL 588 Has Been Effective in Reducing the Risk of Injury Associated with Seasonal and Decorative Lighting Products

The incident data suggest that UL 588 has contributed to a decline in the risk of injury associated with seasonal and decorative lighting products, *see* Tab E, Seasonal Lighting and Decorative Products: Fire or Shock Incidents from 1980 to 2013. If incandescent light strings last approximately three seasons of use,[3] then it can be expected that product changes made to conform to new requirements in the voluntary standard would be evident within a period of time thereafter. As discussed below, incident data show decreases in deaths and nonfatal injuries associated with seasonal and decorative lighting products after the 1997 changes to the UL standard.

Table 3 lists the deaths associated with seasonal and decorative lighting products for the periods 1980−1996 and 2000−2013. The years from 1997 to 1999 would have been transitional years, where older products in consumer homes were being replaced with light strings incorporating the January 1, 1997 changes (minimum wire size and overcurrent protection) in the UL standard. The average number of deaths per year and the average number of nonfatal incidents per year were higher before 1997, and the numbers dropped after 1999.

[3] Staff observed that incandescent light strings advertise that the products have a usual design life span of approximately 1,500 hours. Using an average of 12 hours per day for 40 days per year, incandescent light strings last approximately 3 years.

Table 3: Deaths Associated with Seasonal and Decorative Lighting Products

Period	1980–1996	2000−2013
Deaths	202	43
Nonfatal Incidents	762	366
Average Deaths per year	11.88	3.07
Average Nonfatal Incidents per year	44.82	26.14

Figure 4 presents a 3-year moving average for deaths due to seasonal and decorative lighting products, by year, for the period 1980−2013 for data from the Potential Injury Database (IPII), National Electronic Injury Surveillance System (NEISS), and the Death Certificate Database (DTHS). Figure 4 shows that the number of deaths started to decline as early as 1990, and continued on a downward trend to 2013, with the exceptions of yearly fluctuations. This early decrease may be due to various factors, such as changes to UL 588, home building codes, and fire-prevention strategies. Since 2004, the continuation of low death rates is partially attributed to the construction and performance requirements in the current UL 588 standard.

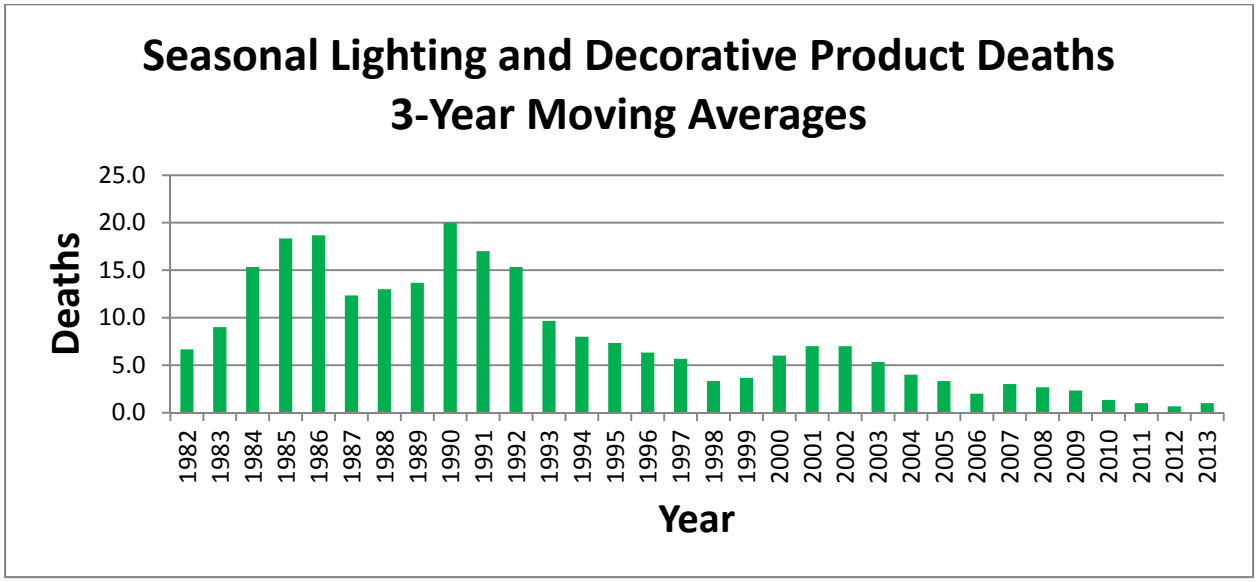


Figure 4. Three-Year Moving Averages of Seasonal Lighting and Decorative Product Deaths from 1980 to 2013

Figure 5 presents a 3-year moving average for nonfatal incidents due to seasonal and decorative lighting products, by year, for the period 1980−2013 for data from IPII and NEISS. Figure 5 also demonstrates an overall downward trend to 2013, with the exceptions of yearly fluctuations. The decrease can be attributed to several factors, including: changes to UL 588, home building code, and fire prevention strategies. However, the construction and performance requirements in the current UL 588 standard for seasonal and decorative lighting products with minimum wire size, sufficient strain relief, and overcurrent protection have made the products safer than products manufactured without these construction and performance requirements.

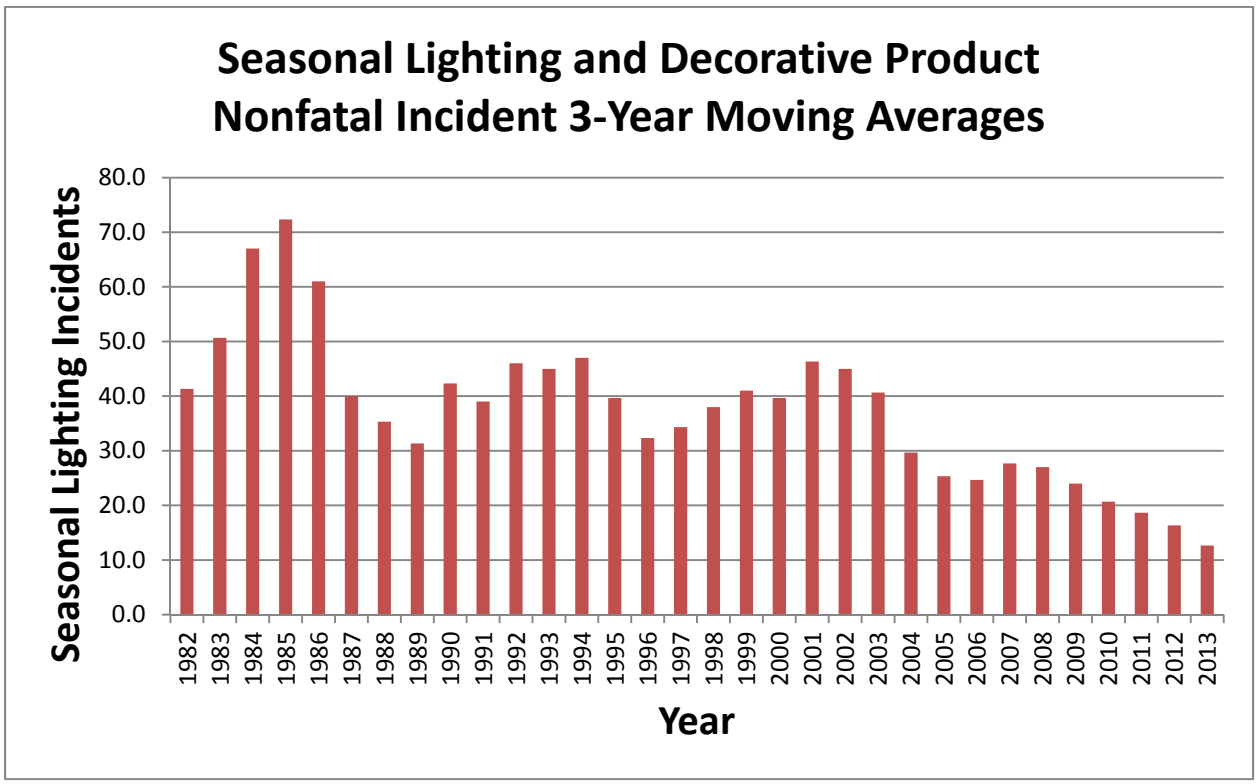


Figure 5. Three-Year Moving Averages of Seasonal Lighting and Decorative Product Nonfatal Incidents from 1980 to 2013

VII. Substantial Compliance with UL 588

Based on CPSC staff's review of market information and compliance activity, as set forth in Tab F, staff estimates that a substantial majority of seasonal and decorative lighting products sold for consumer use in the United States conform to UL 588. Staff further estimates that the conformance level likely is well in excess of 90 percent of units sold, *See* Tab F, Conformance to UL Voluntary Standard for Seasonal and Decorative Lighting Products.

The U.S. Department of Homeland Security's Customs and Border Patrol (CBP) reported that in 2013, the import value of products that would be covered by the draft proposed rule was about $500 million, comprised of roughly 20,000 "entries" or product shipments. If the average import value per unit were $5.00 (based on the range of retail prices observed by staff), then the number of units imported annually may be up to 100 million. CBP also reported that about 550 firms were engaged in the importation of seasonal and decorative lighting products during 2013. Adjusting to exclude shipping companies and other third parties, the total number of firms importing seasonal and decorative lighting products into the United States was probably about 500, with the largest number of shipments originating from the People's Republic of China. An online, wholesale directory identified about 160 manufacturers and suppliers in China, Hong Kong, and Taiwan, with about 120 of these exporting products to the United States. Another online product directory identified more than 2,000 individual models of products from manufacturers located in China.

CPSC staff considers all seasonal and decorative lighting products carrying a listing or certification mark to UL 588 by a testing lab, such as UL, Intertek Company (ETL), or the CSA

Group (CSA), to be in conformance with the requirements of UL 588. Staff's review of the websites of the 20 to 30 most prominent national brands, which probably account for a majority of all units sold, demonstrates that these brands consist only of conforming products because they are labeled as UL, ETL, or CSA compliant. Major retailers also often specify conforming products. Most significantly, as discussed above, although recalls and import stoppages involve a very small percentage of product units in commerce, available CPSC data on recalls and import stoppages over the past decade suggest a very low (less than 1 percent) incidence of defects and nonconformance. All of these factors indicate that conformance with UL requirements is very high. Therefore, staff's best estimate of voluntary conformance is that well in excess of 90 percent of all units likely meet UL 588.

VIII. Small Business Considerations

CPSC staff investigated the potential effects of a proposed rule on small entities, primarily small importers, *See* Tab G, Proposed Section 15(j) Rule for Seasonal and Decorative Lighting Products: Small Business Considerations. Based on staff's review of information on importers, of the roughly 500 companies that import seasonal and decorative lighting products in the United States, staff estimates that 400 to 450 would be considered small firms under the U.S. Small Business Administration's size guidelines.

As noted above, CPSC staff estimates that a very high percentage, probably well in excess of 90 percent of products that would be subject to a rule, already conform to UL 588. Importers, distributors, and retailers that market only UL 588-conforming products would not be affected. Staff has observed that small importers, distributors, and retailers of nonconforming light sets generally market other related products as well. The sales revenue of these small firms is not solely dependent on seasonal lighting products. Thus, income for these small firms would not be affected significantly, and, except for the nonconforming light sets, product lines would not be curtailed significantly. Furthermore, the draft proposed rule represents a continuation of the existing practice of the CPSC's Office of Compliance and Field Operations to designate nonconforming seasonal lighting products as SPHs; CPSC staff would continue to seek recalls or other corrective actions for such products. Based on the available information, the Commission could conclude that a proposed rule to deem nonconforming seasonal and decorative lighting products to be SPHs would likely not have a significant impact on a substantial number of small businesses or other small entities.

IX. Recommended Effective Date

The staff recommends that a final rule listing seasonal and decorative lighting products that do not contain one or more readily observable characteristic (minimum wire size, sufficient strain relief, and overcurrent protection) as SPHs become effective 30 days after publication of a final rule in the *Federal Register* because the products are already in substantial conformance with the standard, and the observable characteristics from UL 588 in the draft proposed rule have been in effect since the 1990s and are well-known. Additionally, the Office of Compliance sent a letter dated July 14, 2014, to manufacturers, importers, and retailers of holiday lights and decorative outfit products, informing them that the Office of Compliance considers products that do not conform to UL 588, regarding minimum wire size, sufficient strain relief, and overcurrent protection, to be defective and present an SPH. Accordingly, relevant stakeholders are on notice

of the requirements of UL 588 such that a 30-day effective date would not likely result in significant impacts on industry or disrupt the supply of conforming products.

X. Commission Options

The following options are available for Commission consideration:

1. Publish a notice of proposed rulemaking (NPR), as drafted by the Office of the General Counsel.
2. Publish an NPR, with changes, as directed by the Commission.
3. Other options, as directed by the Commission.

XI. Staff Recommendation

CPSC staff recommends that the Commission publish the NPR, as drafted by the Office of the General Counsel. CPSC staff also recommends an effective date of 30 days after publication of the final rule in the *Federal Register*.

TAB A: Office of Compliance July 14, 2014 Letter to Manufacturers, Importers, and Retailers of Holiday Lights and Decorative Outfits

TAB A

U.S. CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Marc J. Schoem
Deputy Director
Office of Compliance and Field Operations

Tel: 301-504-7520
Fax: 301-504-0359
email: mschoem@cpsc.gov

July 14, 2014

Manufacturers, Importers, and Retailers of Holiday Lights and Decorative Outfits

Dear Ladies and Gentlemen:

The U. S. Consumer Product Safety Commission (CPSC) is an independent federal regulatory agency responsible for protecting consumers from unreasonable risks of injury and death from consumer products. Our authority in this instance is set forth in the Consumer Product Safety Act (CPSA), 15 U.S.C. §§ 2051–2089.

I am writing to urge you to make certain that the holiday lights and decorative outfits that you import, manufacture, distribute, or sell in the United States comply with the currently applicable voluntary safety standard, UL 588 – *Seasonal and Holiday Decorative Products,* which you can purchase from Underwriters Laboratory Inc. (www.ul.com).

Each year, individuals are seriously injured or killed by seasonal lights and decorative outfits that use undersized wiring, use insufficient strain relief, or omit fuses. From 1980 through 1996, CPSC received reports of 202 deaths and 753 nonfatal incidents involving seasonal lights and decorative outfits that resulted in a fire and/or shock hazard. There were an average of 44.3 nonfatal incidents and 11.9 deaths per year. The UL standard (UL 588) addressed these issues by requiring proper strain relief for wire attachments at the lamp holders in 1994, and by requiring fuses and thicker wiring in 1997. For the period from 2000 to 2013, the average number of nonfatal incidents per year dropped to 26.1, and the average number of deaths per year dropped to 3.1. CPSC staff believes that the changes in the UL standard to incorporate the 1994 and 1997 requirements for strain relief, fuses, and wire size have had an effect on reducing the number of injuries and deaths for seasonal lights and decorative outfits.

Inasmuch as the UL standard has been in place for many years, the CPSC's Office of Compliance and Field Operations staff considers holiday lights and decorative outfits that do not meet the portions of the safety standard referenced above to be defective and to present a substantial product hazard under Section 15(a) of the CPSA, 15 U.S.C. § 2064(a). Should the staff encounter such products, we may seek detention, seizure, destruction, or recall of these products.

No persuasive reason exists for you to import, manufacture, distribute, or sell seasonal lights and decorative outfits that do not meet the UL standard, especially because you are now on direct notice and have direct knowledge of our safety-related concerns, to the extent you were not directly knowledgeable already.

Accordingly, I urge you to review your product line immediately and ensure quickly that all holiday lights and decorative outfits that you manufacture, import, distribute, or sell in the United States are in compliance with the safety standard referenced above. CPSC staff will follow up, as appropriate, to ensure that firms are meeting their obligations in this area.

Section 15(b) of the CPSA, 15 U.S.C. § 2064(b), requires every manufacturer, importer, distributor, and retailer of consumer products to report immediately to the Commission when it obtains information that reasonably supports the conclusion that a product distributed in commerce contains a defect that could create a substantial product hazard or creates an unreasonable risk of serious injury or death. The statute also provides for imposition of civil and criminal penalties for failing to report the required information. CPSC staff shall use all available tools in furtherance of our efforts to ensure consumers are not placed at unreasonable risk of injury from hazardous products.

If you have any questions or we can be of any assistance, you may contact Mary Kroh, CPSC Compliance Officer, at 301-504-7886, or mkroh@cpsc.gov.

Sincerely,

Marc J. Schoem

TAB B: Abbreviated History of Seasonal and Decorative Lighting Products and the Associated UL Standard

TAB B

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO : Arthur S. Lee, Electrical Engineer, Electrical Engineering Division

THROUGH: Joel Recht , Associate Executive Director, Directorate for Engineering Sciences

Andrew M. Trotta, Division Director, Electrical Engineering Division

FROM : Robert T. Garrett, Electrical Engineer, Electrical Engineering Division

SUBJECT : Abbreviated History of Seasonal and Decorative Lighting Products and the Associated UL Standard

This memorandum provides an overview of the historical use of seasonal holiday lights in the United States and the development of associated voluntary standard established by Underwriter's Laboratories (UL).

I. Historical Overview

Wide use of electric miniature-base lamps for Christmas decorations dates to 1895, although some lighting was used on Christmas trees as early as 1882. *See* http://www.oldchristmastreelights.com/timeline.htm. By 1907, the majority of lamps were manufactured in Japan, where lighted decorations had become extremely popular. In 1916, General Electric (GE) introduced tungsten filaments, and in 1919, GE added the flame-shaped MAZDA lamp to its line of fancy figural lights, shaped like fruits, animals, and people. *See also* Robert Iwasama and Patrick Fay, *The History of the Christmas Figural Light Bulb*, 2006. GE discontinued the MAZDA name in 1945, but the company continued to manufacture decorative lamps until 1974.

UL certified decorative light strings for the first time in 1905, for Elblight System's and GE's lighting outfits. In October 1921, UL published the first standard for American electric Christmas light strings, *Standard for Christmas-Tree and Decorative- Lighting Outfits*, now known as UL 588. The earliest light stings merely stated that they were "Approved Lighting Outfits," while sets made after 1929 carried the UL mark, printed either on the box or on a paper tag around the cord.

In 1950, Americans were introduced to miniature or "fairy lights." Fairy lights were first produced in Italy, and other countries soon followed manufacturing fairy lights, including Germany, Holland, and Japan. The earliest of these sets had no bases and were directly wired into the light string. Later, sets used tiny screw-in bases, but manufacturers finally standardized light strings with the familiar plastic-base, push-in lamps. Fairy lights have never been produced in the United States. By 1975, Americans were lighting their trees almost exclusively with imported fairy lights.

The use of light-emitting diodes (LEDs) in decorative lighting started slowly, initially operating from batteries or low-voltage power supplies in the 1990s. LED light strings began to appear on the commercial market around 2000. As technological developments increased light output and the numbers of colors available for LEDs, residential lights strings became more popular, and manufacturers began to power the strings with a power cord plugged into a residential outlet. In 2005, the National Capitol Holiday Tree was lit entirely with LED lights; and in 2006, the Rockefeller Center tree in New York City also was lit entirely with LED lights. In November 2009, UL published the first standard covering LED lighting, *UL 8750—Light Emitting Diode (LED) Equipment for Use in Lighting Products.*

II. Review of Engineering Sciences' Chronological Files: Christmas Lights, File 1729/Miniature Lights, File 1711

CPSC's earliest documented involvement with seasonal lights came in a September 20, 1973 letter from Consumer's Union (CU) to then-CPSC Chairman Richard Simpson. CU provided CPSC with two letters from *Consumer Reports* readers who were concerned with incidents of arcing and fires involving tree light strings. CU noted: "Dangerous seasonal decorations caused 159 injuries during fiscal year 1973 as reported in the NEISS hospital emergency room injury monitoring system . . .."

In 1974, CPSC staff discussed and exchanged correspondence with GE regarding the development of a "national standard" for "Christmas" light sets and lighted decorations. In May 1975, CPSC engineering staff developed a field screening manual for "Midget Christmas Tree Light Strings," which proposed tests of the mechanical strength and integrity of various parts of the light string to prevent loose connections, keep components from coming apart, and halt exposed conductors from causing shock or electrical shorts that might cause fire.

In June 1977, CPSC selected the National Consumers League (NCL) to manage development of a standard for miniature Christmas tree lights, which NCL presented in November 1977. At that time, the Commission's rulemaking procedure was different from the current procedure. In April 1978 [Release Number 78027], CPSC announced that the agency would propose a new regulation, 16 C.F.R. part 1208, Miniature Christmas Tree Lights, which referred to UL 588, 13th Edition, dated November 15, 1974, and the NOEL (National Ornament & Electric Lights Christmas Association) standard, SL-79, dated September 16, 1975. CPSC stated that the existing UL and NOEL standards provided inadequate safety protection. CPSC proposed four additional tests, including overcurrent protection for conductors smaller than 20 AWG:

- proper wiring to minimize overheating and to reduce chances of exposed live parts;
- size and placement of plug blades, plug dimensions, plug and connector strength, and enclosure of electrical live parts in plugs and connectors;
- light bulbs and bulb sockets to resist overheating which could ignite decorations or melt sockets exposing live parts or causing short circuiting;

- protective devices to prevent the flow of too much electric current causing deterioration of light sets and requirements prohibiting accessible live parts in light bulb holders.

In July 1978, UL proposed to revise its standard to include all of CPSC's proposed requirements. CPSC withdrew its proposal in late 1981, after UL agreed to CPSC's proposals. Members of NOEL, however, agreed to employ the NCL standard, which omitted CPSC's recommended tests.

CPSC issued a *Holiday Safety* publication in December 1982. The *Holiday Safety* publication did not mention checking fuses on light strings but warned against using light strings on artificial metal trees. Presumably, UL 588 did not include fuse requirements in 1982. Because the 1985 standard includes a requirement for fuse protection, apparently between 1983 and 1985, UL devised a specific requirement for overcurrent protection to be used in the power plugs on light strings.

In 1985, UL established new provisions in UL 588 that required review or retesting of all UL-listed light strings to prevent shock. The new provisions included tests for fingertip accessibility, strain relief, heat and crush resistance, and protection against contact with energized conductors while changing fuses in the plug. These modifications to the standard implemented overcurrent protection for seasonal light strings. Overcurrent protection prevents overheating conductors in light strings and eliminates the hazard of fire.

CPSC staff received NOEL Christmas Association's Voluntary Standard SL-79 in 1987. NOEL's standard covered miniature lights only. NOEL's standard included requirements for overcurrent protection. However, NOEL reneged on its initial promise to incorporate requirements that CPSC had previously proposed, including cascade failure simulation, millivolt drop, maximum bulb wattage, and heating of lamps and lampholders. Evidently, NOEL also failed to enforce compliance of NOEL certification-marked products with its own minimal standard.

In 1992, CPSC suggested that NOEL may have violated U.S. Federal Trade Commission (FTC) regulations by allowing use of its certification seal without taking steps to ensure compliance with its safety standard. Although CPSC staff found fewer than expected fire incidents involving seasonal lights, annotations in a March 23, 1992, letter to the FTC indicated that light strings using 24 AWG conductors or smaller should have fuse protection.

In June 1991, UL published *Subject 411—Outline of investigation for artificial Christmas trees,* which addressed the hazards of using manufactured trees. In 1991, the Subject was withdrawn, but the replacement, *UL Subject 2358—Outline of Investigation for Fire Tests of Pre-Lit Artificial Seasonal Use Trees and Other Seasonal Decorative Items,* was not published until 2010, and was primarily concerned with "the contribution of seasonal decorative products to a developing fire condition." Presumably, any light strings used would be covered by the requirements of UL 588.

The April 1994 release of UL 588, 16th Edition, contained revisions that mainly affected lampholders (UL 496), but also specified that a light string must have an integral power cord or a

fused power inlet for use with a cord set or detachable power-supply cord. UL 588, 16th Edition, also required strain relief for wire attachments at lampholders and more strict flammability ratings of 94V-0 for polymeric lampholders.

In December 1994, CPSC staff met with UL staff to discuss possible improvements to UL 588 in several areas: continuous versus seasonal use, environmental requirements, obsolete construction, and usage interactions.

CPSC's June 1995 staff report, "Electrical Holiday Lighting," cited annual averages of 500 fire service-attended fires and 30 deaths involving Christmas trees and another 68 fire deaths and shocks specifically related to electrical decorations. The June 1995 staff report stated that in 1994, 129 million miniature light strings were imported, along with 53 million other types of light strings. The 1995 staff report specified seasonal lighting problem areas that UL identified for action in the voluntary standard:

- wet locations, lack of immersion protection;
- strain relief ;
- pin terminals;
- separation between opposite polarities at line voltage fittings;
- polymeric materials' resistance to high temperatures and ignition; and
- fuse holders that leave exposed live parts.

In 1995, UL revised UL 588 to apply to "seasonal lights" that were "portable and not permanently connected," rather than to "Christmas tree lights." UL 588 added distinctions between parallel- and series-connected lighting strings; provided for lighting controllers, low-voltage direct plug-in adaptors, flashing lamps, ornaments that plug into lampholders, and protective lamps or shunts, none of whose descriptions and requirements had been included in previous revisions of the standard. The standard also reduced the minimum stranded conductor size for strings using medium-based lampholders to 20 AWG from 18 AWG. Finally, UL 588 added requirements for controllers, ornaments, direct plug-in units, and splice compartments. In May 1995, UL requested comments on proposed changes to UL 588 to become effective on January 1, 1997.

UL 588, 17th Edition, which became effective on January 1, 1997, introduced specific changes:

- **Flexible cord**: 22 AWG Type CXT for series connected products; for parallel-connected lights: VW-1 flame rating, 105°C temp rating;
- **Over-current protection**: When used, must be provided with 3A fuse for 22 AWG and 5A for 20-18 AWG;
- **Polymeric materials**: Minimum rating was increased to UL 94 V0 or V1; and
- **Outdoor-Use Products**: required to comply with rain, standing water immersion, cold impact, and UV light exposure tests.

In February 2008, UL 588 was revised to take into consideration new types of lights (light emitting diodes, LEDs) that use lower wattages. The 2008 UL standard states that if a string uses a 22 AWG wire, the number of strands linked together can vary, as long as the wattage does not exceed 210. If 20 AWG wire is employed, strings can be added on until the wattage reaches 420, which is the maximum electrical load that 20 AWG conductors can carry without overheating.

III. Conclusion

A voluntary standard for seasonal and decorative lighting products has been in effect and in use by manufacturers for almost as long as these lighting products have existed. The sections of the UL 588 standard that are primarily covered by CPSC's proposed rule have been effective since at least 1997.

TAB C: Readily Observable Safety Characteristics of Seasonal and Decorative Lighting Products

TAB C

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO : Arthur S. Lee, Electrical Engineer, Electrical Engineering Division

THROUGH: Joel Recht , Associate Executive Director, Directorate for Engineering Sciences

Andrew M. Trotta, Division Director, Electrical Engineering Division

FROM : Robert T. Garrett, Electrical Engineer, Electrical Engineering Division

SUBJECT : Readily Observable Safety Characteristics of Seasonal and Decorative Lighting Products

Underwriters Laboratories (UL) *Standard for Safety for Seasonal and Holiday Decorative Products,* UL 588, 18th Edition, approved on August 21, 2000 (UL 588),[1] provides guidance when CPSC staff evaluates lighting strings, such as those used on Christmas trees and wreaths, for safety defects that might present risks of electrical shock or fire. The standard is lengthy and complex; however, it describes three characteristics or features of seasonal and decorative lighting products that are essential for the safe use of such products, and which CPSC staff looks for upon inspection. This memorandum describes three readily observable safety characteristics of seasonal and decorative lighting products and identifies the pertinent sections of UL 588 that define the requirements.

I. Products Within the Scope of the Rule

Staff's draft proposed rule uses the phrase "seasonal and decorative lighting products" to specify the lighting products that are within the scope of the draft proposed rule. Staff recommends defining "seasonal and decorative lighting products" for the purposes of the draft proposed rule, consistent with the definition of products falling within the scope of UL 588:

> Portable, plug-connected, temporary-use lighting products and accessories that have a nominal 120 volt input voltage rating. Lighting products within the scope of the rule are factory-assembled with push-in, midget- or miniature-screw base lampholders connected in series or with candelabra- or intermediate-screw base lampholders connected in parallel, directly across the 120 volt input. Such lighting products include lighted decorative outfits, such as stars, wreathes, candles without shades, light sculptures, blow-molded (plastic) figures, and animated figures. Lighting products outside the scope of the rule include: battery-operated products; products that operate from a transformer or low-voltage power

[1] The UL mark and logo are trademarks of UL, Inc. (formerly known as Underwriters Laboratories, Inc.).

supply; flexible tube lighting strings of lights intended for illumination; and portable electric lamps that are used to illuminate seasonal decorations.

This definition of "seasonal and decorative lighting products" is adapted from descriptions of lighting products defined in section 1 of UL 588. All in-scope products are covered by UL 588. Lighting products within the scope of the rule are typically used seasonally and provide only decorative lumination. The products are displayed for a relatively short period of time and then removed and stored until needed again. UL 588 defines "decorative light products" (decorative outfits) as factory-assembled, electrically powered units providing a seasonal or holiday decorative display having illumination or other decorative effects. A decorative product may contain a lighting string as part of the decorative illumination. A lighting string provided with decorative covers over the lamps is a decorative outfit. If not constructed properly, lighting powered by 120 volts can be damaged easily and can pose a risk of electrical shock, electrocution, or fire.

Lighting products that are not within the scope of the rule (battery- or transformer-operated lighting and portable luminaires, for example) are subject to a different voluntary standard, or they do not present the same risk of injury.

II. Readily Observable Safety Characteristics of Seasonal and Decorative Lighting Products

UL 588 requires a minimum wire size, sufficient strain relief, and overcurrent protection for seasonal and decorative lighting products. CPSC staff believes that such characteristics are readily observable by: measuring the total size of the conductors in the wiring, measuring sustainable force on the wiring at the lampholders and plugs/load fittings, and the presence of fuse(s) in the plug or in-line fuse holder. Table 1 lists the characteristics associated with series-connected and parallel-connected lighting products.

Table 1. Readily Observable Characteristics for Seasonal and Decorative Lighting Products

Seasonal and Decorative Lighting Products		Readily Observable Characteristics			
		Minimum Wire Size (AWG) *UL 588 Section 6*	Sufficient Strain Relief (load weight)		Overcurrent Protection Qty. *UL 588 Section 7*
			Plugs/Load Fittings *UL 588 Section 15 and 71*	Lampholders *UL 588 Section 79 and SB16*	
Series-connected lighting product	With Load Fitting	20 (Polarized Plug)	20 lbs. (smaller than 18 AWG)	24 lbs.	1
		22 (Non-Polarized Plug		8 lbs.	2
	Without Load Fitting	22 (Polarized Plug)		8 lbs.	1
		22 (Non-Polarized Plug		8 lbs.	2
Parallel-connected light product	With or Without Load Fitting	20 (XTW) 18 (all others) All Polarized Plugs	20 lbs. (20 AWG) 30 lbs. (18 AWG)	24 lbs.	1

A. Minimum Wire Size

Using the correct conductor or wire size in a seasonal and decorative lighting product provides the necessary mechanical strength to endure handling and other forces imposed on such

lighting products during use. The wire is constructed with a conductor and an insulation covering. Because of the inherent resistance of copper conductors, the correct conductor size will support the electrical load without overheating or reducing its operating voltage excessively. The wiring is always made using stranded copper wire covered with a layer of insulation and, for the purposes of the following discussion, will be simply called "wire." Wire is measured by units according to the American Wire gauge (AWG). A higher AWG number represents a smaller wire size. For example, 22 AWG is a smaller wire size than a 20 AWG.

Section 6.1 of UL 588, Tables 6.1 and 6.2, specify the wire types and minimum sizes that are required for seasonal lighting products.

Figure 1. Series-connected miniature light string

For series-connected (miniature) light strings (Figure 1), the standard specifies no smaller than 22 AWG wires for all miniature light strings, unless the string also includes a receptacle (called a "load fitting" in UL 588) at the opposite end of a string that has a polarized attachment plug. When the load fitting is polarized, then the wire size must be no smaller than 20 AWG.

Parallel-connected light strings *utilize* larger screw-base bulbs that draw more electrical current (Figure 2), so these strings and decorations require larger wires. Section 6.1 of UL 588 specifies that the minimum conductor size can be either 20 AWG for paired single wire cords or 18 AWG for "zip-cord" (as is used on desk lamps) or two 18 AWG conductors in an additional insulating sleeve (often for outdoor use).

Figure 2. Parallel-connected screw-base bulbs light string

Wire size is observable by measuring the bare conductors. Before measuring the wire size, staff must expose the conductors within the wire. The act of exposing the wire is done quickly and easily by using a small, handheld device used to strip the electrical insulation from the wiring. One method of measurement is to use a circular wire gauge, which can determine if the wire size meets the minimum, as specified in UL 588. Figure 3 demonstrates measurement of the wire size in a seasonal light string using a circular wire size gauge. In CPSC staff's experience, lighting products that do not meet the minimum wire size requirement typically fail by using wiring that is substantially undersized for the product, for example, lighting products that use wiring that is more than six wire sizes smaller than the minimum required.

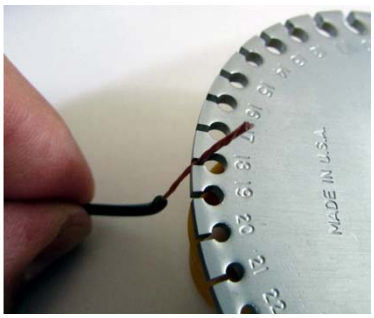


Figure 3: Measuring Wire Size (AWG) of Seasonal Light String

B. Sufficient Strain Relief

Strain relief on wiring that may be handled (*e.g.*, pulled, twisted) during installation or use will protect the connections from:

a) mechanical damage, such as broken strands of copper inside the insulated wire, which could cause overheating despite overcurrent protection; or
b) separation of wires from their terminal connections, which could expose bare energized wires, leading to electrical shock.

Section 15 of UL 588 describes the general requirements that strain relief must be provided on the electrical connection used in seasonal and decorative lighting products. Sections 71, 79, and SB16 of UL 588 describe the specific requirements.

Section 71 of UL 588 specifies a pull test for wiring devices, such as plugs and load fittings. Plugs and load fittings must be subjected to a gradually applied straight pull on the wiring by use of a suspended weight for 60 seconds; and wires must not pull loose or stretch from the plug or load fitting. If the wires are smaller than 18 AWG, the weight applied must be 20 lbs., and if the wires are 18 AWG or larger, the weight applied must be 30 lbs.

Section 79 of UL 588 specifies that series-connected lampholders be subjected to a gradually applied straight pull test on the wiring by use of a suspended weight for 60 seconds. If the wire stretches or pulls loose from the lampholder, the lighting product fails the test. If the wires are smaller than 20 AWG, the weight applied must be a minimum of 8 lbs., and if the wires are 20 AWG or larger, the weight applied must be a minimum of 24 lbs.

Section SB16 of UL 588 specifies that parallel-connected lampholders be subjected to a gradually applied straight pull test on the wiring by use of a suspended weight for 60 seconds. If the wire stretches or pulls loose from the lampholder, the lighting product fails the test. If the wires are 20 AWG or larger, the weight applied must be a minimum of 24 lbs.

The strain relief portion of UL 588 for seasonal and decorative lighting products is observable visually by hanging a weight on the light string for 60 seconds and observing if the weight supports, drops, or stretches the wiring. In CPSC staff's experience, lighting products that fail the strain relief requirements in UL 588 do so immediately, or within a few seconds of suspending the applicable weight.

C. Overcurrent Protection

Overcurrent protection, meaning the presence of a fuse, keeps the wiring of seasonal and decorative lighting products from overheating and melting, which can present risks for fire and electrical shock.

Section 7 of UL 588 describes the requirements for overcurrent protection. Subsection 7.5 requires that a lighting product provided with a polarized plug, such as parallel-connected strings, employ at least one replaceable fuse connected to the ungrounded (narrow) blade of the polarized plug or current tap (see Figure 4). Subsection 7.7 states that a lighting product provided with a non-polarized plug or current tap shall employ two fuses, one connected to each wire, which are not required to be replaceable.

Seasonal and decorative lighting products with overcurrent protection are visually observable by the presence of a fuse holder located in the plug or near the plug. The number of fuses are observable by opening the fuse holder. Figure 5 depicts a light string with a plug containing the fuses required by UL 588. An in-line fuse holder, illustrated in Figure 6, is also permitted and is located within a few inches from a non-fused plug.

Figure 4. Current tap

Figure 5. Fused Plug

Figure 6. In-line fuse holder

III. Conclusion

As described in this memorandum, sections 6, 7, 15, 71, 79, and SB16 of UL 588 require certain safety characteristics for seasonal and decorative lighting products. Specifically, the absence of minimum wire size, sufficient strain relief, and overcurrent protection in seasonal and decorative lighting products creates the potential for electrical shock and fire. CPSC staff can readily observe whether lighting products contain minimum wire size by measuring the conductor in the wire, sufficient strain relief by hanging a load on the cord, and contains overcurrent protection by the presence of a fuse. Accordingly, CPSC staff recommends that the Commission publish the draft proposed rule under section 15(j) to deem the absence of one or more of the described readily observable safety characteristics to be a "substantial product hazard," as defined in section 15(a)(2) of the CPSA.

TAB D: Seasonal and Decorative Lighting Product Recalls and Import Stoppages

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UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO : Arthur Lee, Project Manager
Division of Electrical Engineering

THROUGH: Robert Howell, Acting Assistant Executive Director, Office of Compliance and Field Operations

Marc Schoem, Deputy Director, Office of Compliance and Field Operations

Scott Simmons, Director, Defect Investigations Division

Blake Rose, Lead Compliance Officer Electrical/Fire/Mechanical Hazards Team

FROM : Mary Kroh, Compliance Officer, Defect Investigations Division

SUBJECT : Seasonal and Decorative Lighting Product Recalls and Import Stoppages

I. Introduction

This memorandum provides information related to investigations of seasonal and decorative lighting products conducted by the Office of Compliance and Field Operations.

II. Recall and Import Stoppage Data

From 1974 to August 2014, as shown in Table 1, CPSC staff obtained 47 voluntary recalls of seasonal and decorative lighting products involving a total of 3.6 million units. In addition to product recalls, as shown on Table 2, from 2005 through August 2014, CPSC staff identified 127 shipments at import involving a total of nearly 200,000 lighting units, where the products may not have complied with the relevant UL standard (UL 588). The tables provide the detail on both voluntary recalls and import stoppages by firm (for recalls), year, hazard, and number of units. Table 1, listing lighting product recalls, likely captures all voluntary recalls conducted through August 2014. Table 2, listing import stoppages, likely does not capture all import shipments where the products may not have complied with UL 588.

Note that where the information is available, most of the defects/hazards listed in the tables for which staff made a substantial product hazard preliminary determination, if the draft proposed rule becomes a final rule, would be considered a readily observable characteristic, and such nonconformance would constitute a substantial product hazard under the rule.

Table 1. Seasonal and Decorative Lighting Products Recall

Firm Name	Product Name	Year	Defect/Hazard	# Units	Tot. by Yr.
Noma Worldwide International, Inc.	CHRISTMAS LIGHTS	1974	EXPOSED METAL CONTACTS IN FEMALE END CONNECTOR AND LOOSE OR EXPOSED BARE WIRES MAY RESULT IN FIRE HAZARD OR SHOCK HAZARD.	300,000	
S. S. KRESGE COMPANY	CHRISTMAS TREE LIGHTS	1974	EXPOSED METAL CONTACTS IN FEMALE END CONNECTOR AND LOOSE OR EXPOSED BARE WIRES MAY RESULT IN FIRE HAZARD OR SHOCK HAZARD.		300,000
New York Merchandise Co., Inc.	CHRISTMAS LIGHTS, 35 AND 100 LIGHT SETS	1977	The bulb sockets in these sets may contain incorrectly placed metal electrical contacts that may create a potential fire hazard by shorting out the bulb and overheating the wires.	not avail.	
Consolidated Sales Int'l. Corp.	Toyo 100 Indoor/Outdoor Chasing and Music Christmas Light Sets s	1990	the metal contacts, which are located inside the female connector, to be pulled or pushed out when plugging and unplugging the light strings	1,000,000	
Consolidated Sales Int'l. Corp.	TOYO CHRISTMAS LIGHTS	1990	THE EXPOSED, ENERGIZED METAL TABS INSIDE THE CONNECTOR PRESENT AN ELECTROCUTION HAZARD.		
Eckered Corporation	STRING TO STRING TOYO XMAS LIGHTS	1990	THE EXPOSED, ENERGIZED METAL CONTACTS PRESENT AN ELECTRIC SHOCK OR		
Kmart Corporation	STRING TO STRING TOYO XAMS LIGHTS	1990	THE EXPOSED, ENERGIZED METAL CONTACTS PRESENT AN ELECTRIC SHOCK OR ELECTROCUTION HAZARD.		
RALEYS	TOYO CHRISTMAS LIGHTS	1990	SHOCK/ELECTROCUTION THE EXPOSED, ENERGIZED METAL CONTACTS PRESENT AN ELECTRIC SHOCK OR ELECTROCUTION HAZARD		
Revco	TOYO CHRISTMAS LIGHTS	1990	THE EXPOSED, ENERGIZED METAL TABS INSIDE THE CONNECTOR PRESENT AN ELECTRIC SHOCK OR ELECTROCUTION HAZARD.		
Toyo Distributors, Ltd.	TOYO STRING TO STRING CHRISTMAS LITE	1990	THE EXPOSED, ENERGIZED METAL CONTACTS IN THE TP-6 PRESENT AN ELECTRIC ELECTROCUTION HAZARD.		
Wal Mart Stores Inc.	STRING TO STRING TOYO XMAS LIGHTS	1990	THE EXPOSED, ENERGIZED METAL TABS INSIDE CONNECTOR PRESENT AN ELECTROCUTION HAZARD.		1,000,000
La Pandora Corporation	Swallow Brand 100/5-Way Flasher Light Set, Art. No. 1005PL	1993	No overcurrent protection and undersized wiring	9,990	9,990
Fay's & Fielding, Incorporated	200 Light Set, Spirit of Christmas	1995	POTENTIAL FIRE - FUSES IN THE PLUG COULD MAKE CONTACT	not avail.	
Golden Bay Enterprises, Inc.	Christmas Tree Lights	1997	The lights have no fuse protection and contain inadequate wiring presenting a fire hazard.	30,225	
Thrifty Distributors	Christmas Lights	1997			
In-Mar Trading, Inc.	Christmas Tree Lights	1997	Fire	43,500	
Avon	Christmas tree topper	1997	Fire	21,600	95,325
Hobby Lobby Stores, Inc.	Curtain Lights	1998	Shock/Electrocution—RECALLED	148	
Advance	Christmas Lights	1998	The light sets have flammable plastic parts, bulb	75,000	

Firm Name	Product Name	Year	Defect/Hazard	# Units	Tot. by Yr.
International, Inc.			sockets that can fall apart, no fuse protection, exposed bare wires and undersized wires, presenting a fire hazard.		
Holiday Innovations, Inc.	Christmas Tree Lights	1998		49,000	
Rona Distribution, Inc.	Christmas Lights	1998		30,000	
Star Brothers, Inc.	Christmas Tree Lights	1998		277,750	
STK International, Inc.	Miniature X-Mas Lights	1998		66,263	
Star Brothers, Inc.	Christmas Tree Lights	1998	The lights have weak connections and undersized wires, presenting a fire hazard.	13,000	
Kmart Corporation	Angel tree-top ornament	1998	The fabric used in making these ornaments is flammable, posing a fire hazard.	132,000	
Michaels Stores, Inc.	Christmas ornament	1998	Potential Fire Hazard	206,256	849,417
California Lighting Corporation	Outdoor Christmas Light	1999	Electric shock hazard	0	
Wholesale World, Inc.	Miniature Christmas Lights, 50 lights clear and multicolored & 100 lights clear and multicolored	1999	Electric shock and Fire hazard	0	
Yang Lin Trading, Inc.	100 & 140 miniature XMAS lights	1999	Electrical fires & shock	33,279	33,279
Pergament home centers	100 Mini (Christmas) light set	2000	these lights have undersized wires that can pull out of the plugs and individual light sockets, posing shock or fire hazards.	91,840	
Orman Products	Christmas Lights	2000	lights have undersized wires that can easily pull out of the plugs and individual light sockets, posing fire and shock hazards.	18,000	109,840
Walgreen Company	36" Lighted Artificial Christmas Tree	2001	Possible fire hazard	11,580	
Gem Stores, Inc.	Christmas lite sets	2001	The lights have undersized wires that can easily pull out of the plugs and light sockets, posing electric shock and fire hazards to consumers.	50,000	
Pioneer Paper Company	Christmas light sets	2001		2,600	
Sun Sun Industries Inc.	100 Miniature light set	2001		12,000	76,180
NBG International, Inc.	XMAS lights	2002	The lights have undersize wire and could present electric shock or fire hazards.	100,000	
Winstar International, Inc.	Christmas light set	2002	electrocution and fire potential	100,896	
Flora-Lite Company	holiday light set	2002	electrocution potential	43,600	244,496
Great Gifts, Inc.	ceramic electric holiday lamps	2004	These electric holiday lamps have undersized wiring, no strain relief on the electric cords, and the molded plastic enclosure is flammable.	1,900	1,900

Firm Name	Product Name	Year	Defect/Hazard	# Units	Tot. by Yr.
Target Compliance & Production Services	Holiday Mini Light Sets	2006	These lights have undersized and exposed wires, which pose a risk of electric shock and fire hazards.	861,000	
LTD Commodities, LLC	Decorative Lights	2006	Undersized wiring can result in possible shock or fire hazard.	2,000	863,000
Hobby Lobby Stores Inc.	Christmas tree lights	2007	Electrical shock or fire	1,920	1,920
Universal Distribution Center, LLC	Holiday Light String	2009	Product poses a risk of fire and/or electrical shock.	480	
Four Star Group USA, Inc.	Holiday Light Sets	2009	Electrical wiring in the lights can overheat, posing a fire hazard to consumers	13,000	
Precious Moments, Inc.	Christmas Tree Topper	2009	Potential fire hazard	4,100	17,580
Family Dollar Services, Inc.	Decorative String Lights	2012	Possible fire hazard.	15,958	15,958
Pepe Ganga Corp.	100 Multi Colored Musical Light String	2014	Overheating resulting in fire and electric shock	500	500
			TOTAL UNITS	**3,619,385**	**3,619,385**

Table 2. Seasonal and Decorative Lighting Import Stoppages

Product Name	Year	Defect/Hazard	Units	Total By Yr.
CHRISTMAS LIGHTS	2005	undersized wires, no overcurrent protection	2,940	
CHRISTMAS LIGHTS	2005	not available	3	
35 SUPER BRIGHT MINI LGHT	2005	not available	49	2,992
LIGHT STRING	2006	undersized wiring	2	
CHRISTMAS TREE LIGHTS	2006	undersized wires, lacks overcurrent protection and poor strain relief	200	202
50 LT CHRISTMAS LIGHT SET	2007	not available	18,600	
LIGHT SET DECORATION	2007	not available	857	19,457
CHRISTMAS LIGHTS	2008	undersized wires, fail the strain relief test, & lack mechanical integrity and lack over-current protection	240	
CHRISTMAS LIGHTS	2008	undersized wires, fail the strain relief test, & lack mechanical integrity and lack over-current protection	100	
CHRISTMAS LIGHTS	2008	undersized wires, fail the strain relief test, & lack mechanical integrity and lack over-current protection	240	
CHRISTMAS LIGHT STRING	2008	not available	1,540	
CHRISTMAS LIGHTS	2008	Undersized wire, no overcurrent protection, and no strain relief	4,120	
SRICHAREON LIGHTING SET	2008	Undersized wires, does not have over-current protection the individual lamps have small lamp shades made of a cellophane/thin plastic sheet, which is highly flammable	510	6,750
200L ICICLE LIGHT	2009	not available	960	
150L STRING LIGHT	2009	not available	1,920	

Product Name	Year	Defect/Hazard	Units	Total By Yr.
150L CHASING LIGHT	2009	not available	720	
NET LIGHTS 96 L	2009	All samples have undersized wires and break away easily	3,600	
(SANTA FIGURE)	2009	All samples have undersized wires and break away easily	400	
(SNOWMEN LIGHT)	2009	All samples have undersized wires and break away easily	400	
CHRISTMAS LIGHTS 20 L	2009	All samples have undersized wires and break away easily	1,160	
200 CHANCE LIGHTS 200 L	2009	All samples have undersized wires and break away easily	4,000	
80 LED LIGHT 80 L	2009	All samples have undersized wires and break away easily	400	
30 L STAR LIGHT	2009	All samples have undersized wires and break away easily	1,100	
100 LED LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
100 LED LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
100 LED LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
100 LED LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
XMAS TREE LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
SNOWFLAKE LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
MISTLETOE LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
CANDY CANE LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
HOLIDAY STAR LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
STOCKING LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
HOLIDAY BELL	2009	undersized wire and failure of strain relief tests	1,500	
SANTA FIGURE LIGHT	2009	undersized wire and failure of strain relief tests	1,500	
CRYSTAL BALL LIGHTS	2009	undersized wire and failure of strain relief tests	1,500	
MUSICAL CHRISTMAS LIGHTS	2009	undersized wires, mechanically unstable exposed live wires	1,500	
100 MUSIC LIGHTS COLOR	2009	undersized wires, mechanically unstable exposed live wires	400	
100 MUSIC LIGHTS CLEAR	2009	undersized wires, mechanically unstable exposed live wires	400	
140 MUSIC LIGHT COLOR	2009	undersized wires, mechanically unstable exposed live wires	400	
140 MUSIC LIGHT CLEAR	2009	undersized wires, mechanically unstable exposed live wires	400	
ORNAMENT LIGHTS SMALL	2009	undersized wires, mechanically unstable exposed live wires	240	
ORNAMENT LIGHTS LARGE	2009	undersized wires, mechanically unstable exposed live wires	240	
PEARL LIGHT	2009	undersized wires and fails the strain relief test	480	
NO NAME	2009	undersized wires, mechanically unstable exposed live wires	2,000	
CHRISTMAS LIGHTS	2009	undersized wires, mechanically unstable exposed live wires	2,000	42,220
LIGHT SETS	2010	undersized wires can overheat, fails strain relief tests and no overcurrent protection	45	

Product Name	Year	Defect/Hazard	Units	Total By Yr.
LED RUNNING LIGHTS	2010	inadequate strain relief, insulation on power supply cord displayed cracking, undersized wiring, and the power cord solder connections were not mechanically secured prior to soldering	1,392	1,437
140 LIGHT STAR	2011	undersized wires cause, and fail the strain relief tests	1,200	
113 LIGHT STAR	2011	undersized wires cause, and fail the strain relief tests	1,200	
120 LIGHT SUN	2011	undersized wires cause, and fail the strain relief tests	1,200	
100 LIGHT RIBBON	2011	undersized wires cause, and fail the strain relief tests	5,000	
100 LIGHT BALL	2011	undersized wires cause, and fail the strain relief tests	1,200	
LIGHT CORD	2011	No fuse and the wiring not suitable for indoor/outdoor use as advertised	170	
HOLIDAY LIGHT CORD	2011	No fuse and the wiring not suitable for indoor/outdoor use as advertised	170	
HOLIDAY LIGHT CORD	2011	No fuse and the wiring not suitable for indoor/outdoor use as advertised	275	
HOLIDAY LIGHT CORDS	2011	No fuse and the wiring not suitable for indoor/outdoor use as advertised	140	
C7 100 FT LIGHT STRING GR	2011	lack of over-current protection in the plug and excess number of lamps in the string of lights	40	
C7 100 FT LIGHT STRING WT	2011	lack of over-current protection in the plug and excess number of lamps in the string of lights	30	
100 LED LIGHT	2011	undersized wires, lack replaceable fuses in the plug, and fail the strain relief tests	2,880	
LIGHT TREE	2011	undersized wires, lack replaceable fuses in the plug, and fail the strain relief tests	360	
LIGHT TREE	2011	undersized wires, lack replaceable fuses in the plug, and fail the strain relief tests	360	
100 LED LIGHT	2011	undersized wires, lack replaceable fuses in the plug, and fail the strain relief tests	4,000	
ICICLE LIGHT	2011	undersized wires, lack replaceable fuses in the plug, and fail the strain relief tests	1,000	
CHRISTMAS LIGHTS/ 30 LITE	2011	undersized wires and no over-current protection	150	
CHRISTMAS LIGHTS/ 50 LITE	2011	undersized wires and no over-current protection	200	
STRING LIGHTS W/ CONTROL	2011	not available	9	
LED STRING LIGHTS	2011	failed strain relief test, and lacks overcurrent protection,	125	19,709
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	not available	2,060	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	

Product Name	Year	Defect/Hazard	Units	Total By Yr.
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	undersized wires, and lack of sufficient mechanical integrity at the wire connections	950	
HOLIDAY LIGHTS	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	4,300	
HOLIDAY LIGHTS - WHITE	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	2,304	
HOLIDAY LIGHTS - BLUE	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	3,600	
HOLIDAY LIGHTS - MIXED	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	4,560	
HOLIDAY LIGHTS - MIXED	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	4,560	
HOLIDAY LIGHTS - MIXED	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	1,824	
HOLIDAY LIGHTS - FIVE STA	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	480	
HOLIDAY LIGHTS - XMAS TRE	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	480	
HOLIDAY LIGHTS - MIXED CO	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	480	
HOLIDAY LIGHTS - MIXED CO	2012	products did not have replaceable fuses in the plugs, appeared to have undersized wires, and did not have third party independent laboratory listing	480	
100 LED CHASER LIGHTS	2012	undersized wires and lacks sufficient mechanical integrity at the wire connection	4,360	
HOLIDAY LIGHTS	2012	undersized wires and lacks sufficient mechanical integrity at the wire connection	12,880	
LED TREE	2012	undersized wire, inadequate strain relief	47	
MULTI LIGHTS	2012	undersized wires, and insufficient mechanical integrity at the wire connections to the lamps and the plugs	2,292	
MUSICAL LIGHTS	2012	undersized wires, and insufficient mechanical integrity at the wire connections to the lamps and the plugs	3,408	
100 SUPER BRIGHT CLEAR	2012	undersized wires and lacks sufficient mechanical integrity at the wire connections	2,628	
100 SUPER BRIGHT MULTI	2012	undersized wires and lacks sufficient mechanical integrity at the wire connections	2,628	73,331
HOLIDAY LIGHT	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	500	
HOLIDAY LIGHT	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	500	
HOLIDAY LIGHT	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	500	
HOLIDAY LIGHT	2013	not available	150	

Product Name	Year	Defect/Hazard	Units	Total By Yr.
HOLIDAY LIGHT	2013	not available	150	
HOLIDAY LIGHT	2013	not available	150	
HOLIDAY LIGHT	2013	not available	150	
HOLIDAY LIGHT	2013	not available	150	
HOLIDAY LIGHT	2013	not available	150	
DECORATIVE LIGHTS	2013	lack of a fuse, the connections to the controller box are very poor, insufficient mechanical integrity at the wire connection	2,000	
HOLIDAY LIGHTS	2013	the power cord wires are undersized, the power cord plug does not have fuses, the connections are very poor and insufficient mechanical integrity at the wire connection	400	
HOLIDAY LIGHTS	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	2,000	
HOLIDAY LIGHTS	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	1,120	
HOLIDAY LIGHTS	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	1,080	
HOLIDAY LIGHTS	2013	lack of fuses, undersized wires and the connections the controller boxes are very poor	400	
HOLIDAY LIGHTS	2013	undersized wires and no fuse in the plug	200	
HOLIDAY LIGHTS	2013	undersized wires and no fuse in the plug	1,800	
HOLIDAY LIGHTS	2013	undersized wires and no fuse in the plug	500	
HOLIDAY LIGHTS	2013	undersized wires and no fuse in the plug	2,800	
HOLIDAY LIGHTS	2013	undersized wires and no fuse in the plug	1,400	
LED STRING LIGHTS	2013	undersized wires, and insufficient mechanical integrity at the wire connection	1,000	
LED	2013	not available	13,120	
140 LIGHTS	2013	undersized wires, and insufficient mechanical integrity at the wire connections to the plugs	1,200	31,420
LIGHT SET	2014	not available	303	
LIGHT SET	2014	not available	303	
LIGHT SET	2014	not available	303	
LIGHT SET	2014	not available	303	1,212
		TOTAL UNITS	198,730	198,730

TAB E: Seasonal Lighting and Decorative Products: Fire or Shock Incidents from 1980 to 2013

TAB E

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO: Arthur Lee
Project Manager, Holiday Light 15J Project
Directorate for Engineering Sciences
Division of Electrical Engineering

THROUGH: Kathleen Stralka
Associate Executive Director
Directorate for Epidemiology

Stephen Hanway
Director, Division of Hazard Analysis

FROM: David Miller
Mathematical Statistician, Division of Hazard Analysis

SUBJECT: Seasonal and Decorative Lighting Products: Fire or Shock Incidents from 1980 to 2013

I. Introduction

The Consumer Product Safety Improvement Act of 2008 (CPSIA) expanded Section 15 of the Consumer Product Safety Act (CPSA). Section 15(j) of the CPSA allows the Commission to specify by rule for a consumer product, or class of consumer products, characteristics whose presence or absence the Commission determines presents a substantial product hazard.

CPSC Epidemiology Hazard Analysis staff (EPHA) prepared this memorandum to describe the number of fire or shock incidents in CPSC databases involving seasonal and decorative lighting products from 1980 to 2013 in support of a rulemaking under section 15(j) of the CPSA. This memorandum will show the number of incidents (separately for fatal and non-fatal incidents) by year. Although these incidents do not provide a basis for estimates, they demonstrate that the number of fatal and nonfatal seasonal and decorative lighting products fire and shock incidents (and the number of resulting deaths) reported to CPSC have declined over this 33-year period.

II. Background

Electric lights have been used for seasonal decorations in the United States since the 19th century. In 1921, Underwriters Laboratories (UL) published the first standard for American electric Christmas light strings. CPSC's involvement with seasonal holiday light safety issues

began in 1973. In 1977, CPSC selected the National Consumers League (NCL) to manage development of a standard for miniature Christmas tree lights. CPSC has worked with industry groups and UL through the 1980s, 1990s, and into the 2000s on improvements to safety standards related to electric holiday lights. *See* Tab B, Abbreviated History of Seasonal and Decorative Lighting Products and the Associated UL Standard.

In addition to CPSC's work on improving safety standards for electrical seasonal and decorative lighting products, the CPSC Office of Compliance has conducted product recalls and conducted port surveillance that has led to numerous import stoppages. *See* Tab D, Seasonal and Decorative Lighting Product Recalls and Import Stoppages.

III. Seasonal and Decorative Lighting Product Incident Data

CPSC has seasonal and decorative lighting product incident data from the Injury or Potential Injury Database (IPII), National Electronic Injury Surveillance System (NEISS), and the Death Certificate Database (DTHS). EPHA staff conducted a search of these three databases for incidents that occurred from 1980 to 2013, and that included one of these two product codes: '1711 – Christmas tree lights' or '1736 – Christmas lights, electric (excluding Christmas tree lights).' CPSC staff limited the scope to fire and shock hazard incidents. Some incident reports describe seasonal lighting as a possible cause of the incident. Such cases were not included in the dataset for this rulemaking. The data presented are limited to incident reports concluding that seasonal or decorative lighting products were the cause of a fire or shock incident.

Neither IPII, nor DTHS are statistical samples. CPSC staff cannot use information from these databases to support a national estimate of the number of incidents involving seasonal and decorative lighting products. NEISS is a probability sample, but CPSC staff cannot produce an adequately precise seasonal and decorative lighting product national injury estimate because too few NEISS incidents (16) have been reported for these products. The lighting product incidents captured by our databases each year, although not sufficient to produce estimates, provide annual minimums of seasonal and decorative lighting product incidents.

If, as one might expect, CPSC databases are able to capture a larger proportion of the fatal incidents (for example, if fatalities are more likely to be reported by news media, which CPSC data captures) than the nonfatal incidents, then CPSC tallies for deaths and fatal incidents will be closer to the true numbers than CPSC staff's tallies for nonfatal incidents. However, CPSC staff does not know the extent to which fatalities and nonfatalities are underreported.

CPSC staff found a total of 132 fatal incidents, 256 deaths, and 1,255 nonfatal incidents that involved seasonal decorative lighting products, were in-scope, and occurred between 1980 and 2013. Figure 1 shows a 3-year moving average of tallies for fatal seasonal and decorative lighting incidents that occurred in 1980 to 2013. Figure 2 shows a 3-year moving average of tallies for deaths from these incidents. A single incident can result in multiple deaths, hence the distinction. The graphs use 3-year averages to smooth out short-term fluctuations.

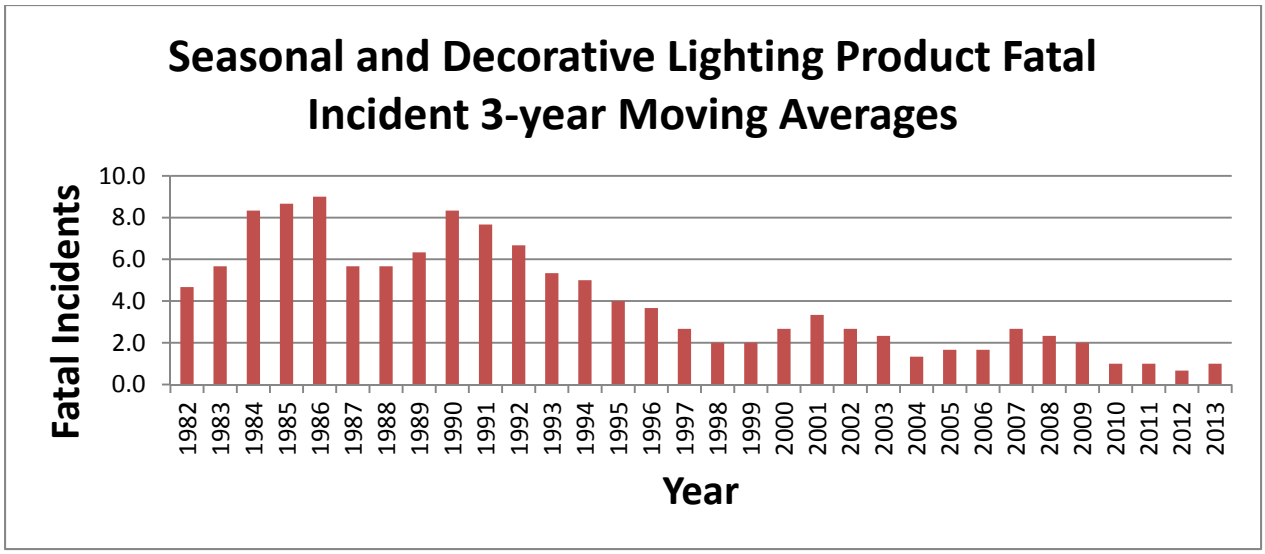

Figure 1. Three-Year Moving Averages[5] of Fatal Seasonal and Decorative Lighting Product Incidents from 1980 – 2013

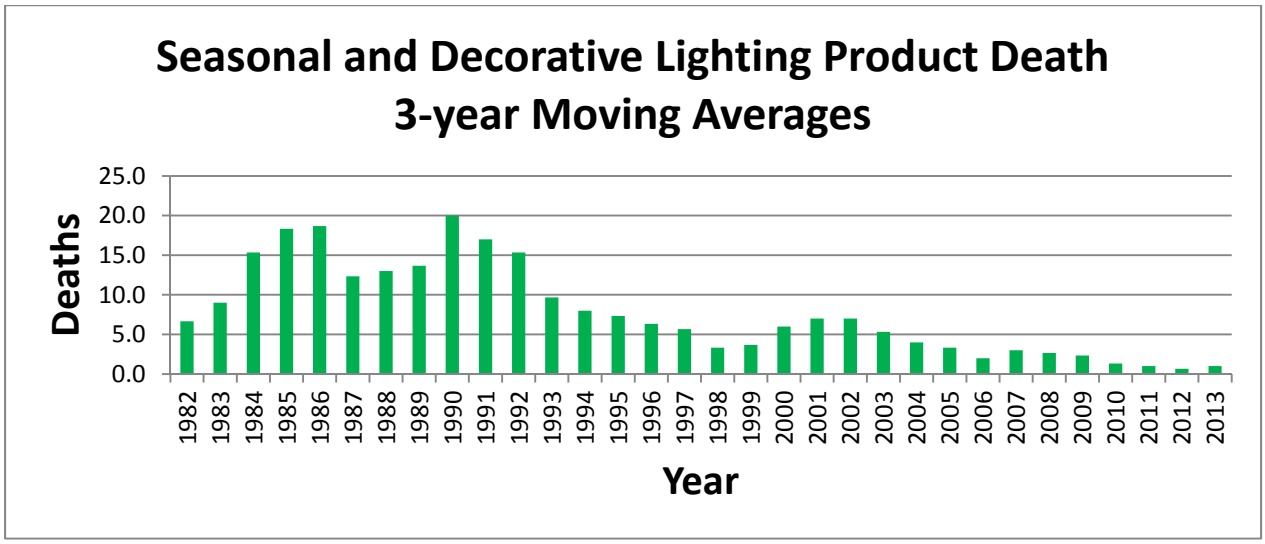

Figure 2. Three-Year Moving Averages of Seasonal and Decorative Lighting Product Deaths from 1980 – 2013

Figure 3 shows a 3-year moving average of tallies for nonfatal incidents (including cases from IPII and NEISS). A majority of the incidents are reported in IPII (98.7 percent); and only 16 incidents are reported in NEISS. Some of the IPII cases involve injuries and some do not. In this period (1980–2013), CPSC staff deemed 130 incidents reported between IPII and NEISS to be *possible* seasonal or decorative lighting product fire or shock incidents. Staff excluded possible lighting product incidents because the incidents were not identified conclusively to fall within the scope of seasonal or decorative lighting product incidents. As mentioned earlier, these tallies are not estimates of seasonal and decorative lighting product incidents, but instead, are

[5] The year refers to the average for the 3 years leading up to, and including, that year. For example, the number for 1994 (5.0), is the annual average number of fatal incidents from 1992 to 1994.

minimums because they are all of the reported incidents that CPSC has captured in its databases for this period.

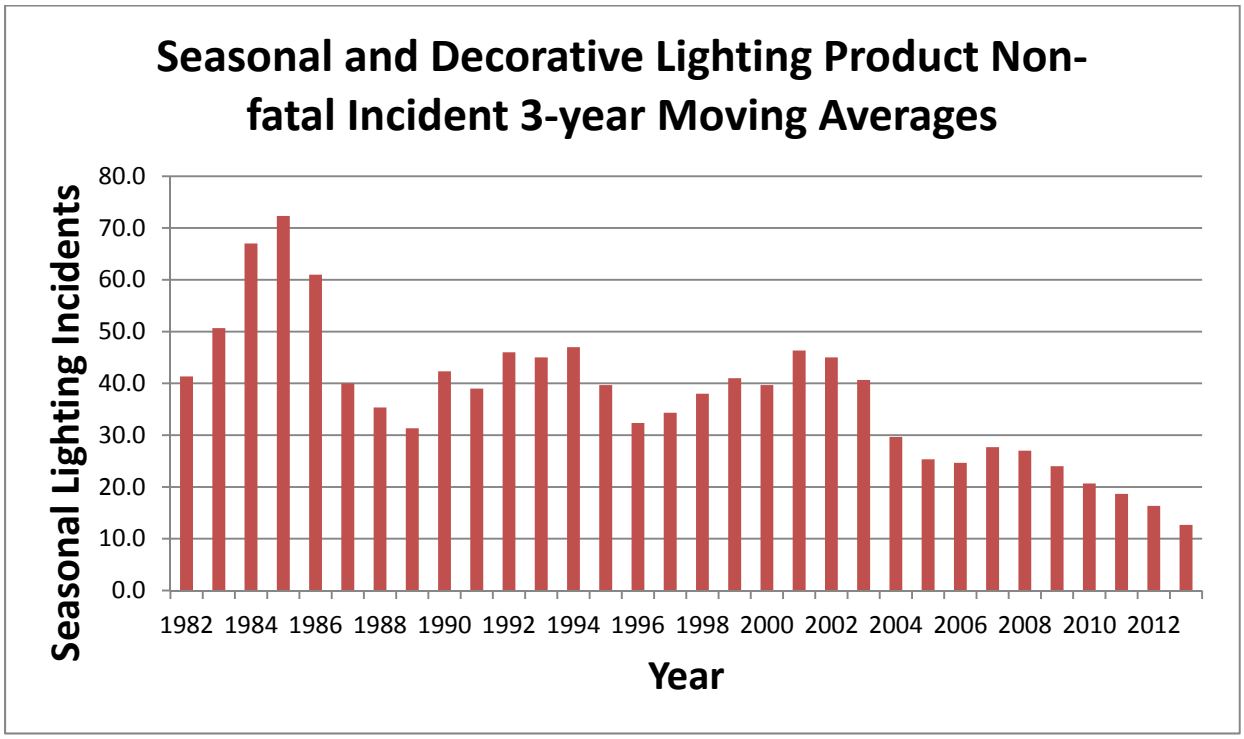

Figure 3. Three-Year Moving Averages of Seasonal and Decorative Lighting Product Non-fatal Incidents from 1980 – 2013

The graphs provided demonstrate that CPSC is aware of more fatal and nonfatal incidents in the 1980s and the early 1990s than in subsequent years. The number of reported incidents has declined over time. Table 1 shows the annual average number of incidents for five different periods for each of fatal incidents, deaths, and nonfatal incidents. The 34-year period is broken up into four 7-year periods and a 6-year period. Reporting may not be complete for the most recent period because sometimes, CPSC receives reports of incidents years after they have occurred. Table 1 shows a similar overall decrease as the figures above demonstrate. The number of reported fire and shock incidents associated with seasonal and decorative lighting products, including fatal incidents, deaths, and nonfatal incidents, have declined since the 1980s and early 1990s.

Table 1. Seasonal and Decorative Lighting Product Annual Average[6] of Fatal Incidents, Deaths, and Non-fatal Incidents from 1980 – 2013

Years	Fatal Incidents	Deaths	Non-fatal Incidents
1980 – 1986	6.7	12.6	54.1
1987 – 1993	6.3	13.6	40.9
1994 – 2000	2.9	5.9	37.4
2001 – 2007	2.1	3.6	32.6
2008 - 2013	1.0	1.2	16.7

IV. Conclusions

CPSC Epidemiology Hazard Analysis staff (EPHA) demonstrates, although these incident reports do not provide a basis for estimates, that the number of fatal and nonfatal seasonal and decorative lighting product fire and shock incidents (and the number of resulting deaths) reported to CPSC have declined over this 33-year period.

[6] The numbers are given as annual averages instead of totals because there are four 7-year periods and one 6-year period.

TAB F: Conformance to UL Voluntary Standard for Seasonal and Decorative Lighting Products

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO : Arthur S. Lee, Project Manager, Directorate for Engineering Sciences

THROUGH: Gregory B. Rodgers, AED, Directorate for Economic Analysis

Deborah V. Aiken, Senior Staff Coordinator,
Directorate for Economic Analysis

FROM : Dale R. Ray, Directorate for Economic Analysis

SUBJECT : Conformance to UL Voluntary Standard for Seasonal and Decorative Lighting Products

This memorandum provides information about the likely extent of conformance to the voluntary standard, UL 588, *Standard for Seasonal and Holiday Decorative Products* (UL 588),[1] for Christmas and other seasonal lighting and decorative products. Readily available information suggests that the level of voluntary conformance among products on the market is high.

I. Background

U.S. Consumer Product Safety Commission (CPSC) staff is preparing a draft proposed rule under Section 15(j) of the Consumer Product Safety Act (CPSA). The draft proposed rule would allow the Commission to determine that seasonal and decorative lighting products that do not conform to one or more of three readily observable characteristics set forth in UL 588 present a substantial product hazard (SPH). UL 588 incorporates performance tests, labeling specifications, and other requirements to address fire and electrocution risks. CPSC staff considers UL 588 effective at reducing fire and electrocution risks associated with seasonal and decorative lighting products. UL 588 has been in place for many years, and currently, the standard is in its 18th edition. UL incorporated the current requirements for strain relief in 1994 and for overcurrent protection and minimum wire sizes in 1997. CPSC staff has since observed a general downward trend in fire and shock incidents involving these products.[2]

The draft proposed rule describes the following three readily observable characteristics, as described in UL 588:

- minimum wire size;
- sufficient strain relief; and
- overcurrent protection.

[1] The UL mark and logo are trademarks of UL, Inc. (formerly known as Underwriters Laboratories, Inc.).
[2] Tab E, Seasonal and Decorative Lighting Products: Fire or Shock Incidents from 1980 to 2013, D. Miller, CPSC, 2014.

Seasonal and decorative lighting products that fall within the scope of UL 588 and the draft proposed rule, and that do not conform to one or more of these provisions, would present an SPH and be subject to appropriate enforcement action, such as a product recall, or seizure and forfeiture upon importation.

II. Product & Market Information

A. Products

The proposed rule would apply to seasonal and decorative lighting products. UL 588 defines "seasonal" as temporary installation and use, customarily for less than 90 days. These are portable, plug-connected, temporary-use lighting products and accessories that have a maximum 120 volt input rating. The products are factory-assembled, with push-in, midget, or miniature screw-in base lampholders connected in series, or with candelabra- or intermediate-screw base lampholders connected in parallel. Products may be for indoor or outdoor use.

All in-scope products are covered by UL 588. Some examples are depicted below.

Typical Mini-Light Set (push-in mini-base bulbs)

Typical C7 Light Set (screw-in candelabra bulbs)

Typical Lighted Wreath (push-in mini-base bulbs)

Various subsets of products would be included in or excluded from the scope of the rule, as described in Table 1. The products that are out of scope for the draft proposed rule are not subject to UL 588, or they do not present the same risks of injury.

Table 1: Seasonal and Decorative Lighting Products Within the Scope of the Draft Proposed Rule

In Scope: • Incandescent or LED light sets, 120 volts, cord-connected, either series or parallel wired, with either screw-in or mini-base push-in bulbs • Pre-lit artificial trees, wreaths, menorahs, lawn figures, light sculptures and other decorative outfits and accessories incorporating light sets
Out of Scope: • Rope, tube, or tape lights without replaceable bulbs • Landscape lights or other permanent lighting devices, either assembled or unassembled • Battery-operated or transformer-connected light sets • Unlighted ornaments that replace a push-in mini-bulb

B. Market Data

CPSC staff found limited information about the market for seasonal and decorative lighting products and producers and sellers. All lighting products that would be subject to the draft proposed rule appear to be imported, primarily from the People's Republic of China and from the Republic of China (Taiwan). Most of the imported products are enumerated under the International Trade Commission's Harmonized Tariff System of the United States (HTS) code 9405.30.00, "Lighting Sets of a Kind Used for Christmas Trees." A very small number of products and components may be included under another general HTS code, 9405.40.8000, "Other Electric Lamps and Fittings." The U.S. Department of Homeland Security's Customs and Border Patrol (CBP) reported that in 2013, the value of imports for both of these HTS categories was about $1 billion. Both categories include commercial lighting products not intended for household use. Adjusting for the likely overstatement of consumer-market products, especially in the latter category, the estimated 2013 import value for seasonal and decorative lighting products may be about $500 million, comprising roughly 20,000 "entries" or shipments. A very small percentage of holiday *ornaments* could consist of lighted ornaments that were not captured in the other HTS category data. CPSC staff's best overall estimate of 2013 import value of seasonal and decorative lighting products that may fall within the scope of the draft proposed rule is about $500 million.

North American Industry Classification System (NAICS) data on domestic manufacturing of "other lighting equipment" (NAICS code 335129) from the U.S. Department of Commerce do not provide useful information. As noted above, no known U.S. production of seasonal and decorative lighting products exists for the consumer market. A small number of American manufacturers do produce specialty lighting products for the commercial market; however, even commercial items, which are covered under other UL standards, are primarily imported.

CBP reported that about 550 firms were engaged in trade during 2013, for the two HTS categories mentioned above. Adjusting to exclude shipping companies and other third parties, the total number of firms importing seasonal and decorative lighting products into the United States was probably about 500. Some of these firms are wholesalers that market products only to retailers; other importers are also retailers that market directly to consumers.

CBP reports that the largest number of shipments in 2013, under these two HTS categories, originated from China. The online wholesale directory, GlobalSources.com, identified about 160 seasonal and decorative lighting products manufacturers and suppliers in China, Hong Kong, and Taiwan; about 120 of these export to the United States. Another product directory, Made-in-China.com, identified more than 2,000 individual models of products from Chinese manufacturers.

Seasonal and decorative lighting products are distributed by hundreds of importers through thousands of brick-and-mortar retailers, and increasingly, through direct, online sales to consumers. Basic light string products are highly homogeneous, and generally compete on price; more expensive items may be differentiated by features such as colored lights or jackets, unusual designs, or decorative adornments. Importers may market multiple brands from a single foreign

manufacturer, or from multiple manufacturers. Although some low-priced products are unbranded, roughly 20 to 30 national brands (including those of several major retailers) are dominant in online catalogs and directories.

C. Usage and Product Life

According to the U.S. Census Bureau, there are roughly 115 million U.S. households. A substantial majority of households may own at least one seasonal and decorative lighting product; although no published estimates of usage are available, it is possible that the number of holiday light-owning households could approach 100 million. Furthermore, many households have multiple lighting products or separate groups for indoor or outdoor use. The total number of seasonal and decorative lighting products in occasional use is probably in the hundreds of millions.

Seasonal and decorative lighting products are generally low import value items. Based on the range of observed retail prices, most products probably have an import value (before distribution chain mark-ups) in the range of $1.00 to $10.00 per unit. If the average import value were $5.00, then the roughly $500 million in import value reported in the 2013 HTS data would represent about 100 million units per year ($500 million ÷ $5).

Retail prices of seasonal and decorative lighting products range from a few dollars (for the least expensive mini lights sets) to more than $50 (for the largest candelabra sets), and may be up to $100 or more for other decorations incorporating light sets. Staff observed that typical retail pricing for a 50-light set is roughly $10.00 to $20.00. Most seasonal lighting products do not represent a major expenditure for most households. Many purchases are to replace older, used, or inoperable units.

Mini-bulb light sets far outsell candelabra-base-bulb sets; although in recent years, the larger, C-5 and C-7 base bulbs, in both incandescent and LED configuration, have made something of a comeback in the residential market. Specific market share data are not available, but CPSC staff estimates the relative mini-light share of unit sales (including pre-lit trees, wreaths, and decorative outfits, all of which appear overwhelmingly mini-bulb-equipped) to be at least 80 to 90 percent, and less than 10 to 20 percent for candelabra units.

The durability of seasonal and decorative lighting products may vary widely depending on frequency of use, storage conditions during non-use, and quality of component materials. Some products may be discarded rather than repaired following a lamp or fuse malfunction. Very inexpensive units may fail and be discarded after only a season or two. More costly lighting products may be cared for better or may be constructed more sturdily (***e.g.***, for outdoor use), and therefore, may last for many years. Incandescent bulb light strings typically have a manufacturer-rated design life span of 1,500 to 3,000 hours. A reasonable estimate of average useful life for lighting products is roughly 3 to 6 years. LED light strings, which are designed not to burn out, may last substantially longer. LED lights were not widely available before the latest UL 588 revisions.

III. Estimated Voluntary Conformance

A. Testing & Certification to UL 588

Three testing organizations certify U.S.-market seasonal and decorative lighting products as conforming to UL 588: UL; Intertek Co. (ETL); and CSA Group (CSA, formerly known as the Canadian Standards Association). All three companies perform tests in accordance with the UL standard and sell listing mark rights to manufacturers, importers, or private labelers. Typically, products at lower retail prices more often tend to carry the ETL certification mark, while higher-priced items more often tend to carry the UL or CSA mark. Although some lighting products may be defective and fail to conform even though the products carry a listing or certification mark, such incidents appear to be rare. Over the past decade, only one CPSC-related recall, and none of the known import stoppages, involved products from importers that offer only UL-conforming electrical products. For purposes of this analysis, all products carrying the UL, ETL, or CSA mark are presumed to be in conformance with UL 588.

Some major retailers require their suppliers to provide only UL-listed or similarly certified electrical products. These retailers are leading sellers, through in-store sales, as well as online sales processed by independent suppliers. Retailers' specifications may encourage many suppliers to offer UL-conforming products.

B. CPSC Compliance and Enforcement Data

Recent data on seasonal and decorative lighting product recalls and import stoppages[3] show a general decline in both enforcement categories, generally consistent with the decline in reported fire and shock incidents. Recalls since 2004 involved nine companies and fewer than 1 million units; the 127 reported import stoppages during that period involved an additional 31 companies and fewer than 200,000 units. Assuming that these totals present a reasonably accurate view of nonconformance, the recalled and stopped lighting products over the entire last decade represent less than 10 percent of the estimated 500 importers and less than 1 percent of the roughly 100 million units imported *annually* in recent years.

C. Estimated Level of Conformance

Direct data on shipments of seasonal and decorative lighting products that comply with UL 588 are not available; however, a reasonable estimate of UL 588 conformance can be made based on the following points:

- A review of online catalogs and directories revealed 20 to 30 national brands of seasonal and decorative lighting products; such products are likely to represent a majority of all units sold. All of these major brands are advertised to be UL, ETL, or CSA listed.

[3] Tab D, Seasonal and Decorative Lighting Product Recalls and Import Stoppages, M. Kroh, CPSC, 2014.

- Some major retailers specify that lighting products must conform to the UL standard; these retailers and their online affiliates account for an unknown but large proportion of seasonal and decorative lighting product sales.
- Available CPSC data on recalls and import stoppages suggest a very low incidence of defects and nonconformance, in the range of less than 1 percent. This is an indicator that conformance to the UL standard is likely very high.

Based on this information, CPSC staff estimates that the current level of compliance with UL's voluntary standard for seasonal and decorative lighting products, UL 588, is very high among units sold to consumers in the United States. In view of the very low incidence of observed defects and import stoppages, staff estimates that the conformance level is likely well in excess of 90 percent.

TAB G: Proposed Section 15(j) Rule for Seasonal and Decorative Lighting Products: Small Business Considerations

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814

MEMORANDUM

Date: August 28, 2014

TO : Arthur S. Lee, Project Manager, Directorate for Engineering Sciences

THROUGH: Gregory B. Rodgers, AED, Directorate for Economic Analysis

Deborah V. Aiken, Senior Staff Coordinator, Directorate for Economic Analysis

FROM : Dale R. Ray, Directorate for Economic Analysis

SUBJECT : Proposed Section 15(j) Rule for Seasonal and Decorative Lighting Products: Small Business Considerations

This memorandum addresses small business considerations related to a draft proposed rule under section 15(j) of the Consumer Product Safety Act (CPSA). The draft proposed rule would allow the U. S. Consumer Product Safety Commission (CPSC, Commission) to determine that seasonal and decorative lighting products that do not conform to one or more of three readily observable characteristics set forth in a voluntary standard, UL588, *Standard for Seasonal and Holiday Decorative Products*,[1] present a substantial product hazard (SPH).

I. Background

Section 223 of the Consumer Product Safety Improvement Act of 2008 (CPSIA) amended section 15 of the CPSA with the addition of section 15(j), 15 U.S.C. § 2064(j). The amendment states that the Commission may specify, by rule, characteristics of products that present an SPH if: (a) the characteristics are readily observable and have been addressed by voluntary standards; and (b) such standards have effectively reduced the risk from the products, and there is substantial compliance with such standards. The Commission is considering a draft proposed rule designating seasonal and decorative lighting products not conforming to one or more of three readily observable characteristics in UL 588 as SPHs. UL 588 incorporates performance tests, labeling specifications, and other requirements to address fire and electrocution risks. CPSC staff considers the standard to be effective in reducing the risk of injury associated with seasonal and decorative lighting products. The standard has been in place for many years: UL 588 is currently in its 18th edition. UL incorporated changes to the standard regarding overcurrent protection and minimum wire sizes into UL 588 in the late 1990s.

[1] The UL mark and logo are trademarks of UL, Inc. (formerly known as Underwriters Laboratories, Inc.).

Available information suggests that the number of fire and shock incidents has declined since these requirements in UL 588 became effective.[2] Furthermore, the current level of voluntary conformance among products on the market appears to be high.[3]

The draft proposed rule would make the absence of one or more of the following three readily observable characteristics required in UL 588 a reason for deeming seasonal and decorative lighting products an SPH:

- minimum wire size;
- sufficient strain relief; and
- overcurrent protection.

Seasonal and decorative lighting products that fall within the scope of UL 588 and the draft proposed rule that do not conform to these provisions would present an SPH and be subject to appropriate enforcement action, such as a product recall, or seizure and forfeiture upon importation.

II. Market & Industry Information

A. Market Data

The proposed rule would apply to seasonal and decorative lighting products intended for occasional or temporary use. Articles covered by UL 588 and subject to the draft proposed rule would include, for example:

- Portable, incandescent, or LED light strings, 120v, cord-connected, either series or parallel wired for indoor or outdoor household use, with either screw-in or mini-base push-in bulbs; and
- Pre-lit artificial trees, wreaths, menorahs, light sculptures, and other lighted, decorative outfits and accessories.

CPSC staff found limited information about the market for seasonal and decorative lighting products and about producers and sellers. Products that would be subject to the proposed rule appear to be imported, primarily from the People's Republic of China and from the Republic of China (Taiwan). Most of the imports are enumerated under the International Trade Commission's Harmonized Tariff System of the United States (HTS) code 9405.30.00, "Lighting Sets of a Kind used for Christmas Trees." A very small number of light sets and components may be included under another general HTS code, 9405.40.8000, "Other Electric Lamps and Fittings." CPSC staff estimates the 2013 import value for seasonal and decorative lighting products to be about $500 million, comprising roughly 20,000 "entries" or shipments.

[2] Tab E, Seasonal and Decorative Lighting Products: Fire or Shock Incidents from 1980 to 2013, D. Miller, CPSC, 2014.
[3] Tab F, Conformance to UL Standard for Seasonal and Decorative Lighting Products, D. Ray, CPSC, 2014.

B. Industry and Small Business Overview

Based on reports from the U.S. Department of Homeland Security's Customs and Border Patrol (CBP), CPSC staff estimates that about 500 firms engaged in importing seasonal and decorative lighting products in 2013. The U.S. Small Business Administration's (SBA) size standards identify "small" businesses in terms of either employment or annual receipts, and vary by business sectors described in the U.S. Department of Commerce's North American Industry Classification System (NAICS). The following categories of firms potentially subject to the draft proposed rule would be considered "small" under the SBA standards:

1. Domestic manufacturers of "other lighting equipment" (NAICS code 335129) with fewer than 500 employees;
2. Merchant wholesalers (including importers) of durable goods (NAICS Subsector 423) with fewer than 100 employees;
3. Retail stores (NAICS subsectors 443-453) with average annual receipts of less than $27 million−to $30 million (depending on subsector); and
4. Non-store retailers (*i.e.*, online or mail order, NAICS subsector 454) with average annual receipts of less than $30 million−to $30.5 million.

As noted previously, no known U.S. production of seasonal and decorative lighting products exists for the consumer market; thus, there may be no firms in category 1 above. A small number of American manufacturers produce specialty light sets for the commercial market; however, even commercial items, which are covered under other UL standards, are primarily imported.

Some overlap is likely among the three latter categories. The "merchant wholesalers" category 2 above represents most of the roughly 500 seasonal and decorative lighting product importers. Many importers are wholesalers that market products only to retailers; however, many other importers are also retailers that market directly to consumers, often via the Internet. Thus, some firms in category 2 may identify being within category 3 or 4, as well.

Importers of seasonal and decorative lighting products typically also market various kinds of holiday or other novelty products, and may not consistently market the same brands or import from the same sources from year to year, or even during a given year. Some importers also offer conforming lighting products at similar or slightly higher prices.

CPSC staff's review of shipping records and on-line directories suggests that, of the roughly 500 importers that may be subject to the draft proposed rule, perhaps 50 to 100 are medium-sized or larger retailers that would not be considered small businesses. The remaining 400 to 450 firms are likely small under the SBA size standards.

III. Small Business Impact

A proposed rule designating seasonal and decorative lighting products that do not conform to any one of the three specified provisions of UL 588 as SPHs will not likely have a

significant impact on a substantial number of small businesses or other small entities. This conclusion is based on the following evidence:

- CPSC staff estimates that a very high percentage, probably well in excess of 90 percent, of seasonal and decorative lighting products already conform to UL 588.[4] Importers and retailers that market only UL 588-conforming products would not be affected by the draft proposed rule. Thus, a substantial majority of firms, including small firms, would probably experience no impact.
- To the extent that small importers may market nonconforming seasonal and decorative lighting products, such firms generally market other, related products (perhaps including conforming lighting products) as well. The sales revenue of these small firms is not solely dependent on seasonal and decorative lighting products. Furthermore, conforming lighting products are readily available, so small importers' incomes would not be affected significantly, and product lines would not be curtailed significantly.
- Under the draft proposed rule, seasonal and decorative lighting products would have to meet the requirements in the specified sections of UL 588 to avoid an SPH determination by the Commission. Testing to UL 588 and certification would not be required. Most importers, however, would likely choose to demonstrate regulatory compliance by obtaining UL or other certification. Potential costs associated with UL 588 conformance to those few foreign manufacturers may offer non-conforming products may include costs associated with the use of higher quality components, more stringent assembly quality control, and the purchase of listing marks from the certifying organizations if a manufacturer chooses to use such a mark. The price of the listing marks reflects the cost of testing and periodic quality evaluations conducted by UL, ETL, or CSA. These costs may be reflected in the wholesale cost of finished goods to importers. The expected cost increase to importers would be a few cents for a typical 50-light incandescent or LED light string or decorative lighted item. This would not represent a significant increase in total product costs, and would not represent a significant burden to small importers.
- The draft proposed rule represents a continuation of the existing practice of the CPSC's Office of Compliance and Field Operations to designate seasonal and decorative lighting products that lack over current protection, use undersized wiring, or have insufficient strain relief, as SPHs; CPSC staff would continue to seek recalls or other enforcement actions for such products, regardless of the rule's existence.

Furthermore, in view of the substantial existing conformance and longstanding knowledge among importers about the UL 588 requirements, importers would likely have ample time to acquire conforming products, if necessary, from their overseas suppliers within normal business cycles before a final rule is promulgated. Therefore, the relatively short proposed effective date (30 days from the publication date of a final rule in the *Federal Register*) would not likely result in significant adverse impacts on importers or disruptions in the supply of conforming products.

[4] *Ibid*.