

**ARE CONSUMERS ADEQUATELY PROTECTED FROM
FLAMMABILITY OF UPHOLSTERED FURNITURE?
HEARING ON THE EFFECTIVENESS OF FUR-
NITURE FLAMMABILITY STANDARDS AND
FLAME-RETARDANT CHEMICALS**

HEARING

BEFORE A

SUBCOMMITTEE OF THE
COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

SPECIAL HEARING

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CHEMICALS**

TUESDAY, JULY 17, 2012

U.S. SENATE,
SUBCOMMITTEE ON FINANCIAL SERVICES
AND GENERAL GOVERNMENT,
COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:30 p.m., in room SD-138, Dirksen Senate Office Building, Hon. Richard J. Durbin (chairman) presiding.

Present: Senators Durbin, Lautenberg, and Moran.

OPENING STATEMENT OF SENATOR RICHARD J. DURBIN

Senator DURBIN. Good afternoon. Today, I am pleased to convene this hearing of the Appropriations Subcommittee on Financial Services and General Government to discuss standards for the flammability of residential upholstered furniture and the use of flame-retardant chemicals, and whether efforts to date are adequately protecting American consumers.

I am going to be joined later by Senator Jerry Moran, my ranking member, and possibly Senator Frank R. Lautenberg, and other colleagues. I thank them all for their interest in this issue.

I welcome the Chairman of the Consumer Product Safety Commission (CPSC), Inez M. Tenenbaum, and the acting Assistant Administrator of the Environmental Protection Agency's (EPA) Office of Chemical Safety and Pollution Prevention, James J. Jones. I also welcome our second panel of witnesses we'll hear from a little later.

Why are we holding this hearing? According to national fire loss estimates for 2005 to 2009, upholstered furniture was the first household item to ignite in an average of 7,040 reported home structure fires every year. These fires caused an estimated annual average of 500 deaths, 890 injuries, and \$442 million in direct property damage.

Once upholstered furniture is ignited, it burns extremely rapidly, because of the fuel in the upholstery filling materials. Lighted tobacco products or smoking materials remain the leading cause of

upholstered furniture fires and associated losses. One out of every six such fires started by smoking materials resulted in death.

In May, the Chicago Tribune published a four-part series on flame-retardant chemicals. It was an eye-opener. It explored the role of the major tobacco companies, which sought to shift focus away from cigarettes as the cause of fire deaths, and chemical companies, which wanted to preserve a market for their products.

Tobacco industry efforts with State fire marshals steered policymakers away from developing a fire-safe cigarette and instead toward rules requiring furniture flammability standards. That, in turn, led to the widespread use of flame-retardant chemicals.

The Chicago Tribune articles also highlighted research showing that flame-retardant chemicals escape from household products and settle in dust, causing infants and toddlers to have higher levels of these chemicals in their bodies than their parents. American newborns have the highest recorded concentration of flame-retardant chemicals than any infants in any other country.

This led Graco, one the Nation's largest children's product manufacturers, to ban the use of some toxic flame retardants in their products. Graco has recently announced that they will begin eliminating four of the most toxic flame-retardant chemicals from their products, including car seats and strollers.

The list of banned chemicals includes Firemaster 550, a chemical mixture that the current research and even the Tribune articles have shown to accumulate in humans and the environment.

The chemical industry points to research justifying the use of fire retardants. The Chicago Tribune exposes that research many times is distorted and based on manipulated data.

Finally, the series discusses the toxicity of flame retardants and the difficulties that EPA faces in restricting the use of flame-retardant chemicals in furniture.

What we will learn today is a little more about fires, furniture, fire-retardant chemicals, and, maybe as important, the role of the Government when it comes to these issues.

On our first panel, we are going to hear from CPSC, an obvious first stop in this conversation. They have been working, as you will find, for many years on a proposed standard for the flammability of upholstered furniture.

Upholstered furniture that catches fire is a leading cause of death in residential fires from consumer products. In recent years, CPSC has been working on a standard that would require upholstery to resist smoldering cigarettes, which are by far the leading cause of furniture fires.

To complete an upholstered furniture flammability standard, CPSC must comply with the Flammable Fabrics Act passed by the Congress, which sets the standards for testing. They are wide-ranging and lengthy, the standards.

As part of them, CPSC conducted testing to establish the effectiveness of different strategies on reducing furniture flammability.

I expect that CPSC will provide an update on this research, the status of the rulemaking, the remaining steps to finalize a rule, and any outstanding issues.

Also on the first panel, we will hear from EPA. They regulate the manufacture and use of flame-retardant chemicals under the Toxic

Substances Control Act (TSCA). Recent scientific research has demonstrated these chemicals accumulate in the environment and can cause cancer, neurological disorders, and impaired reproduction.

During this hearing, we hope to learn more about the public health and environmental effects of flame-retardant chemicals used in furniture. Additionally, we hope to hear what authority TSCA gives EPA to regulate these potentially dangerous chemicals and any recent actions taken by EPA with respect to them.

With the next panel we are going to hear from is an Illinois-based company well known to most, Underwriters Laboratories (UL). It's an independent, not-for-profit standards developer that tests products and certifies those that are consistent with public safety and those that are not.

Over time, the company has built a brand that reassures consumers the products they are purchasing are safe. In 2008, UL initiated testing on different methods of reducing upholstered furniture flammability and reducing the fire growth rate of upholstered furniture.

Some of their findings will likely have us taking a second look at the furniture we have in our homes. They are here today to discuss the results of their testing on furniture flammability.

We are going to also hear from the American Home Furnishings Alliance, representing the manufacturers and importers of residential furniture that include upholstered furniture. Much like CPSC, the manufacturers have been involved in developing upholstered furniture flammability standards. They will share their insights regarding current standards and ongoing work with CPSC to determine a new standard.

Finally, we are going to hear from a veteran firefighter and fire-safety expert to discuss the changes that have taken place in America affecting home fire safety and the factors leading to home fires. He will also tell us about the human cost associated with fires and very simple steps, including creating effective flammability standards, that we can take to help reduce this risk for consumers and firefighters alike.

After reading the Chicago Tribune articles, I was struck by several disturbing things. First, the intentional distortion and manipulation of research in order to deceive Americans into thinking that the use of flame-retardant chemicals in furniture provided additional protection in home fires even though the data do not support the claim; the extensive lobbying and significant funding spent by chemical companies and the tobacco industry to ensure that flame-retardant chemicals were used in furniture and to suppress opposition to their inclusion; and the growing awareness that flame-retardant chemicals in furniture may not add any benefit, and, in many cases, may cause harm to public health and the environment.

Generations of Americans have been asked to tolerate what may be an unsafe level of exposure to potentially toxic chemicals in their furniture in the name of fire safety. If the scientific evidence suggests this solution is not justified, we must move quickly to update our upholstered furniture flammability standards and limit our exposure to these dangerous chemicals.

Today, we'll attempt to gain a clear understanding of whether consumers are protected from flammability furniture, a leading

cause of house fires. We'll explore what's been happening with residential upholstered furniture flammability standards and the effectiveness of these chemicals.

We'll start by exploring CPSC's process for finalizing a standard, and then move to EPA for their statements on the actual chemicals involved.

PREPARED STATEMENT

I'd like to say, as a matter of record, we have a vote scheduled at 3 o'clock, which will probably go until about 3:15 or 3:20 p.m., so my ranking member, Senator Moran, and I will try to accommodate that vote and be sure that we make it and not interrupt this hearing indefinitely.

[The statement follows:]

PREPARED STATEMENT OF SENATOR RICHARD J. DURBIN

Good afternoon. Today, I am pleased to convene this hearing of the Appropriations Subcommittee on Financial Services and General Government to discuss standards for the flammability of residential upholstered furniture and the use of flame-retardant chemicals, and whether efforts to date are adequately protecting consumers and the public.

I welcome Senator Jerry Moran, the ranking member, Senator Frank R. Lautenberg, and possibly other colleagues are joining me today. I welcome the Chairman of the Consumer Product Safety Commission (CPSC) Inez M. Tenenbaum, and the Acting Assistant Administrator of the Environmental Protection Agency's (EPA) Office of Chemical Safety and Pollution Prevention, James J. Jones. I also welcome our second panel of witnesses who we will hear from a bit later.

According to national fire loss estimates for 2005–2009, upholstered furniture was the first household item to ignite in an average of 7,040 reported home structure fires per year. These fires caused an estimated annual average of 500 deaths, 890 injuries, and \$442 million in direct property damage. Once upholstered furniture is ignited, it burns extremely rapid because of the fuel in the upholstery filling materials. Lighted tobacco products (or smoking materials) remain the leading cause of upholstered furniture fires and associated losses. One out of every six such fires started by smoking materials resulted in death.

In May, the Chicago Tribune published a four-part series on flame-retardant chemicals. It explored the role of Big Tobacco, which sought to shift focus away from cigarettes as the cause of fire deaths; and chemical companies, which wanted to preserve a lucrative market for their products. The tobacco industry's efforts with State fire marshals steered policymakers away from developing a fire-safe cigarette standard and instead toward rules requiring furniture flammability standards. That, in turn, led to the widespread use of flame-retardant chemicals.

In addition, the Chicago Tribune articles highlight research showing that flame-retardant chemicals escape from household products and settle in dust, causing infants and toddlers to have higher levels of these chemicals in their bodies than their parents. American newborns have the highest recorded concentrations of flame retardants than infants from any other country.

This has led Graco—one of the Nation's largest children's product manufacturers—to ban the use of some toxic flame retardants in their products. Graco has recently announced that they will begin eliminating four of the most toxic flame-retardant chemicals from their products, which include car seats and strollers. The list of banned chemicals includes Firemaster 550, a chemical mixture that the current research and Chicago Tribune articles have shown to accumulate in humans and the environment.

The chemical industry points to research justifying the use of fire retardants. The Tribune exposes that research as distorted and based on manipulated data. Finally, the series discusses the toxicity of flame retardants and the difficulties that EPA faces in restricting the use of flame-retardant chemicals in furniture.

ROLES OF WITNESSES

Today, on our first panel, we will hear from CPSC, which has been working on a proposed standard for the flammability of upholstered furniture.

Upholstered furniture that catches fire is a leading cause of death in residential fires from consumer products. In recent years, CPSC has been working on a standard that would require upholstery to resist smoldering cigarettes, which are by far the leading cause of furniture fires.

To complete an upholstered furniture flammability standard, CPSC must comply with Flammable Fabrics Act requirements, which are wide-ranging and lengthy. As part of the standards process, CPSC conducted testing to establish the effectiveness of different strategies on reducing flammability. I expect that CPSC will provide an update on their research, the status of the rulemaking, the remaining steps to finalizing the rule, and any outstanding issues yet to be resolved.

Also on the first panel, we will hear from EPA, which regulates the manufacture and use of flame-retardant chemicals under the Toxic Substances Control Act (TSCA). Recent scientific research has demonstrated that these chemicals accumulate in the environment and that they can cause cancer, neurological disorders, and impaired reproduction.

During this hearing, we hope to learn more about the public health and environmental effects of flame-retardant chemicals used in furniture filling. Additionally, we hope to hear what authority TSCA gives EPA to regulate these potentially dangerous chemicals and any recent actions EPA has taken with respect to flame-retardant chemicals.

On our second panel, we will hear from Illinois-based Underwriters Laboratories (UL), an independent, not-for-profit standards developer and product testing and certification organizer dedicated to public safety. Over time, the company has built a brand that reassures consumers that the products they are purchasing are safe. In 2008, UL initiated testing on different methods of reducing upholstered furniture flammability and reducing the fire growth rate of upholstered furniture. Some of their findings will likely have us all taking a second look at the furniture we have in our homes. They are here today to discuss the results of their testing on furniture flammability.

We will also hear from the American Home Furnishings Alliance, which represents manufacturers and importers of residential furnishings that include upholstered furniture. Much like CPSC, the manufacturers have been involved in developing upholstered furniture flammability standards. They will share their insights regarding current standards and their ongoing work with CPSC to develop a new nationwide furniture flammability standard.

Finally, we will hear from a veteran firefighter and fire-safety expert. He will discuss the changes that have taken place affecting home fire safety and factors leading to home fires. He will also tell us about the human cost associated with fires and the simple steps—including creating effective flammability standards—that we can take to help reduce this risk for consumers and the firefighters responding to these hazards.

SUMMARY OF THE ISSUES

After reading the Chicago Tribune articles, I was struck by several disturbing aspects such as:

- the intentional distortion and manipulation of research in order to deceive Americans into thinking that the use of flame-retardant chemicals in furniture provided additional protection in home fires even though the data do not support this claim;
- the extensive lobbying and significant funding spent by chemical companies and the tobacco industry to ensure that flame-retardant chemicals were used in furniture and to suppress any opposition to their inclusion in furniture;
- the growing awareness that flame-retardant chemicals in furniture filling may not add any benefit, and may, in fact, cause harm to public health and the environment.

Generations of Americans have been asked to tolerate what may be an unsafe level of exposure to potentially toxic chemicals in their furniture in the name of fire safety. If the scientific evidence suggests this solution is not justified, we must move quickly to update our upholstered furniture flammability standards and help limit exposure to these chemicals.

Today, we'll attempt to gain a clear understanding of whether consumers are adequately protected from flammability of upholstered furniture—a leading cause of house fires. We'll explore what's been happening with residential upholstered furniture flammability standards and the effectiveness of flame-retardant chemicals.

We'll begin by exploring the CPSC process for finalizing such a standard. And then, we'll examine whether EPA has the necessary authority to ensure the safety of flame-retardant chemicals prior to their entry into the marketplace.

Senator DURBIN. At this point, I'd like to turn over the floor to my ranking member, Senator Jerry Moran.

STATEMENT OF SENATOR JERRY MORAN

Senator MORAN. Mr. Chairman, thank you. I thank the witnesses for appearing before our subcommittee today. And I look forward to their testimony.

As you indicated, there have been a series of articles written in the Chicago Tribune, which have elevated interest in flame-retardant chemicals. These chemicals are found in products we encounter throughout daily life—cars, automobiles, plastics, electronics and other household goods, and upholstered furniture, which is the primary focus of your hearing today.

Flame retardants are one of many safety tools that we have at our disposal, such as sprinklers and smoke detectors. And, collectively, these tools have made a difference in reducing fire injuries and death, even as fuel loads and potentially flammable materials have increased dramatically in households and office buildings.

This has been acknowledged by a variety of manufacturing sectors, which rely upon flame retardants to help meet Government-mandated or voluntary flammability standards for products and component parts.

This is a complex issue involving State standards, Federal standards, and industry standards, which, from electronics to construction to automotive and also home furnishing products, these technical standards are often developed through a consensus approach and there is often careful thought given to ensuring the standards do not favor one method of compliance over another, but focus on meeting a fire-safety test.

In some instances, manufacturers voluntarily decide to meet a particular product fire-safety standard, while in other cases product components must meet fire-safety tests as a regulatory prerequisite for sale in a market like California's standard 117 for furniture sales.

We must let the safety experts, like CPSC and EPA, work within their regulatory framework to address the safety of these products. Changes to the authorizing statutes at these agencies should be made by the Senate Commerce Committee, which has jurisdiction over the Consumer Product Safety Act and the Flammable Fabrics Act, and the Senate Environment and Public Works Committee, which has jurisdiction over TSCA. And that Committee will have a hearing on the reauthorization of that act with EPA on July 24, later this month.

PREPARED STATEMENT

I'd like to ask unanimous consent a report from Dr. Matt Blais, the director of Fire Technology Department at Southwest Research Institution, be included in the record.

And I look forward to the testimony of the witnesses.

Senator DURBIN. Without objection, that statement will be included.

[The statement follow:]

THE UTILITY OF CALIFORNIA TECHNICAL BULLETIN 117: DOES THE REGULATION ADD VALUE?

The implementation of California Technical Bulletin 117 (CA TB 117) set minimum performance standards for furnishings in incipient fire situations. The intent was to protect life and property from fires initiated by small sources such as matches, cigarettes, lighters, and candles. The standard was not intended to prevent ignition of a furnishing in a large fire where it would contribute to the fuel load of a room but not be the point of initiation.

Urethane foam-filled furnishings have the potential for contributing tremendous energy to a fire and when not protected with flame retardants can lead to rapid transition from incipient fire to a free-burning condition. The time to reach flashover (spread to the rest of the room) in a recent study performed at Southwest Research Institute (SwRI®) by Janssens et al.¹ was as short as 200 seconds from time of ignition. The addition of flame-retardant covering over the foam adds a layer of defense that delays transition to flashover to almost 800 seconds from initiation. The additional use of CA TB 117 rated urethane foams prevented sustained burning when a small ignition source was used. In cases where the CA TB-117 foams are used with flammable coverings, significant reductions in both peak Heat Release Rate (HRR) and total HRR were measured and a significant delay in reaching the free-burning condition was observed.

The impact of adding flame retardants to the covering material and urethane foams adds defense in depth to the furnishing that undoubtedly saves lives. The fact that nonflame-retardant furnishings contribute to flashover in a room in just a little more than 3 minutes severely limits the potential for escape for a family in a fire situation. It also would likely result in the total loss of the home before a fire department could respond. Extending the time to greater than 13 minutes increases the probability of escape for the family and allows for greater response time and likely reduces the total damage sustained by the structure.

The cigarette ignition source is less important today than in the past due to a reduction in the number of smokers and changes in cigarette technology. Cigarette wrappers are self-extinguishing when there is not airflow for extended periods. However, ignition from a small flame source is still a significant problem for homeowners with small children. The following facts were obtained from U.S. Fire Administration/National Fire Data Center:

- An estimated 20,200 residential structure fires in 2002, resulted in 276 deaths, 1,445 injuries, and \$322 million loss.²

- The leading causes of residential structure fires are incendiary/suspicious, open flame, and children playing with lighters and matches fires.²

CA TB 117 uses ignition sources that mimic those found in the types of fires described. The testing performed in Janssens' is directly comparable to the CA TB 117 and CA TB 133 requirements. Three types of ignition sources were used:

- a small match-like flame;
- a large gas burner, similar to a fire in a pile of newspapers; and
- a small liquid pool fire simulating the use of an accelerant.

Three ignition source locations were evaluated:

- exposing the seat from the top;
- exposing the furniture from the front bottom; and
- exposing the back.

Test Conditions

In most cases the small-flame ignition source was BS 5852 Source #1 simulating a match fire. In a few tests the item could not be ignited with this source and BS 5852 Source #2 was then tried simulating a lighter or candle. Both BS 5852 sources involve a diffusion burner consisting of a steel tube, with 8 mm outside diameter and 6.5 mm internal diameter and 200 mm in length, connected by a flexible tube via a rotameter, fine control valve, an optional on-off valve, and a regulator to a cylinder containing butane.

For Source #1, a flow rate of 45 ml/min at 25 °C was used, corresponding to a heat release rate of ca. 83 W and a flame height of 35 mm, measured from the top of the burner tube, when held vertically upwards. For Source #2, a flow rate of 160 ml/min at 25 °C was used, corresponding to a heat release rate of ca. 295 W and a flame height of 145 mm, measured from the top of the burner tube, when held

¹Reducing Uncertainty of Quantifying the Burning Rate of Upholstered Furniture, No. 2010-DN-BX-K221, awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice, December 30, 2011.

²U.S. Fire Administration/National Fire Data Center, Residential Structure Match- or Lighter-Ignited Fires, Topical Fire Research Series, Volume 4—Issue 2, October 2004.

vertically upwards. Butane gas was used as the fuel. The burner flame was applied for 20 s for Source #1, or 40 s for Source #2. Source #1 has been shown to have an intensity equivalent to a small match. The small-flame source is shown in Figure 1 being applied to a chair mock-up.

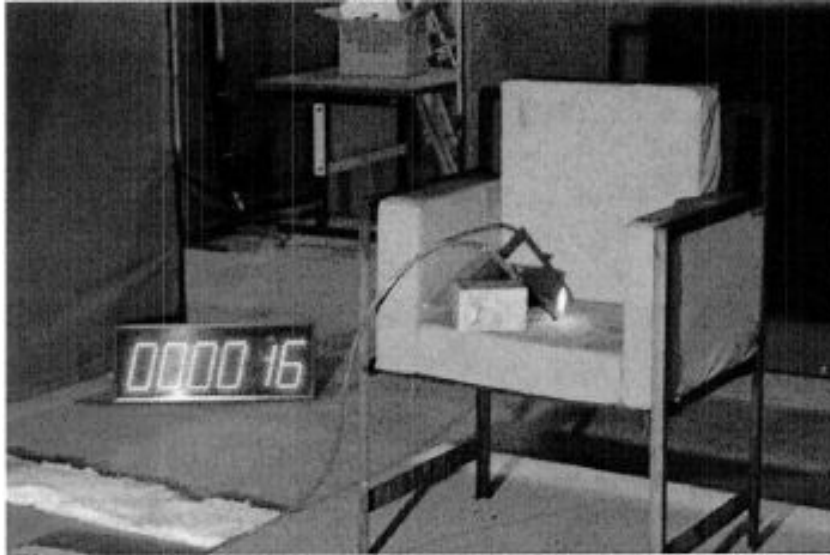


FIGURE 1.—*Small flame source*

The propane burner described in CA TB 133 and American Society for Testing and Materials (ASTM) E-1537 was chosen as the large flame ignition source exposing the seat from the top. This 250×250 mm square burner consisted of 13 mm outside diameter stainless steel tubing with holes pointing straight out, straight down, and inward at a 45 degree angle at various locations. Propane gas with a net heat of combustion of 46.5 MJ/kg was supplied at a rate of 13 l/min for a total of 80 s. The burner was an approximate intensity of 19 kW. Figure 2 shows the large-flame source burner applied to a three-cushion couch mock-up.

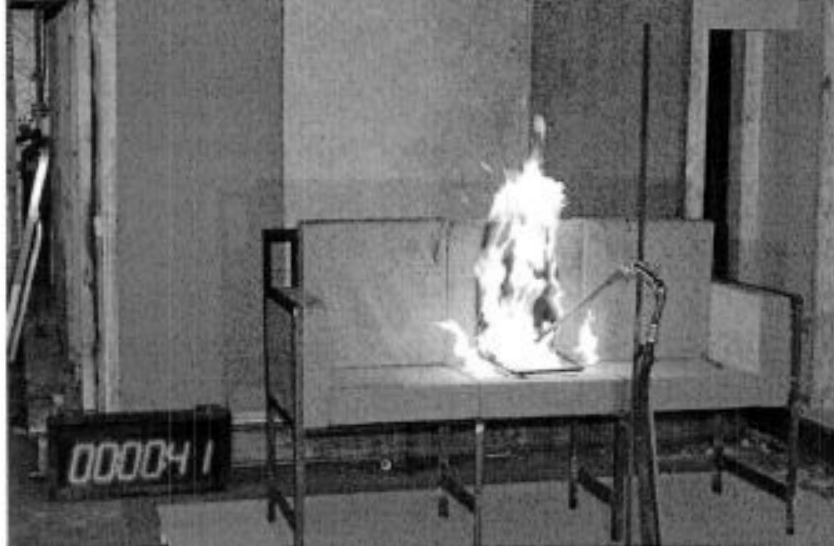


FIGURE 2.—*Large burner ignition source*

The 0.3×0.3 m sandbox burner described in National Fire Protection Association (NFPA) 286 was chosen as the large-flame ignition source for front bottom and back exposure. The burner was supplied with propane at the same rate (19 kW) and for the same duration (80 s) as the CA TB 133 burner. Figure 3 shows the application of the large-flame sandbox burner to the bottom front of a three-cushion couch mock-up.



FIGURE 3.—*Large-flame ignition source burner box*

Finally, the liquid pool fire ignition source consisted of 59 ml (2 oz) of gasoline distributed over a seat cushion (top exposure) or 118 ml (4 oz) of gasoline distributed more than 25 mm thick ceramic fiber blanket placed inside a 0.28×0.43 m

metal cookie sheet (front, bottom, and back exposure). Figure 4 shows the accelerant ignition source for this series of tests applied to a center cushion.

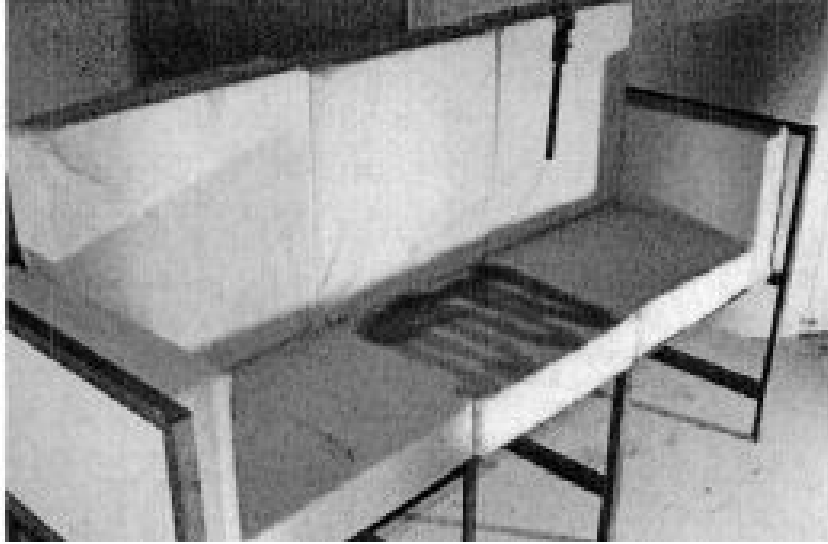


FIGURE 4.—Accelerant ignition source

Test Items

Because of the questionable pedigree for used furniture items, most of the tests were performed on furniture mock-ups with metal frames. The mockup cushions were constructed with fabrics and padding materials that are common in furniture items that are currently on the market. Six different padding materials and two fabrics were selected. Chairs (without armrests) and single-, double-, and triple-seat sofas were included in the test matrix. Table 1 shows the matrix of materials used to create the mock-ups for this series of tests.

TABLE 1.—MOCK-UP MATERIALS OF CONSTRUCTION

Fabric	ID	Color	Supplier	Weight (g/m ²)
(Nonflame-retardant) cotton.	Eco Linen	Khaki	San Antonio Upholstery Fabrics	355
Flame-retardant cotton	Milano	Black	Dazian, North Hollywood, California	415
Padding	ID	CA TB 117	Supplier	Density (kg/m ³)
LD polyurethane foam	1030	San Antonio Upholstery Supply	17
HD polyurethane foam	25110	San Antonio Upholstery Supply	45
CA TB 117 polyurethane foam.	FR1534	✓	San Antonio Upholstery Supply	23
Polychloroprene latex	CR SAFGUARD XL	✓	Chestnut Ridge, Latrobe, Pennsylvania.	103
Polyester wrap	Dacron	✓	San Antonio Upholstery Supply	16
Densified polyester	FlameChek (Core)	✓	Bob Barker, Fuquay-Varina, North Carolina.	23

The flame-retardant cotton fabric was verified to meet the requirements of NFPA 701. CA TB 117 tests were performed on specimens of the six padding materials to verify compliance (or noncompliance) with the standard. The test matrix used for this series of tests is summarized in Tables 2 and 3.

TABLE 2.—DETAILS OF THE FRACTIONAL FACTORIAL EXPERIMENTS

	1-Seat Sofa (Fraction A)						3-Seat Sofa (Fraction B)					
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
LD polyurethane padding	✓						✓					
HD polyurethane padding			✓						✓			
CA TB 117 foam polyurethane padding					✓						✓	
Small flame	✓						✓					
Large gas burner		✓						✓				
Liquid pool fire			✓						✓			
Top	✓				✓				✓			
Front bottom			✓						✓			
Back		✓				✓		✓				✓

TABLE 3.—ADDITIONAL ROOM CALORIMETER TESTS ON MOCKUPS

	Chairs					1-Seat Sofas						2-Seat Sofas			3-Seat Sofas				
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(Nonflame-retardant) cotton	✓					✓	✓	✓	✓	✓							✓	✓	✓
Flame-retardant cotton																			
LD polyurethane foam						✓													
HD polyurethane foam	✓			✓															
CA TB 117 polyurethane foam		✓																	
Polychloroprene latex																			

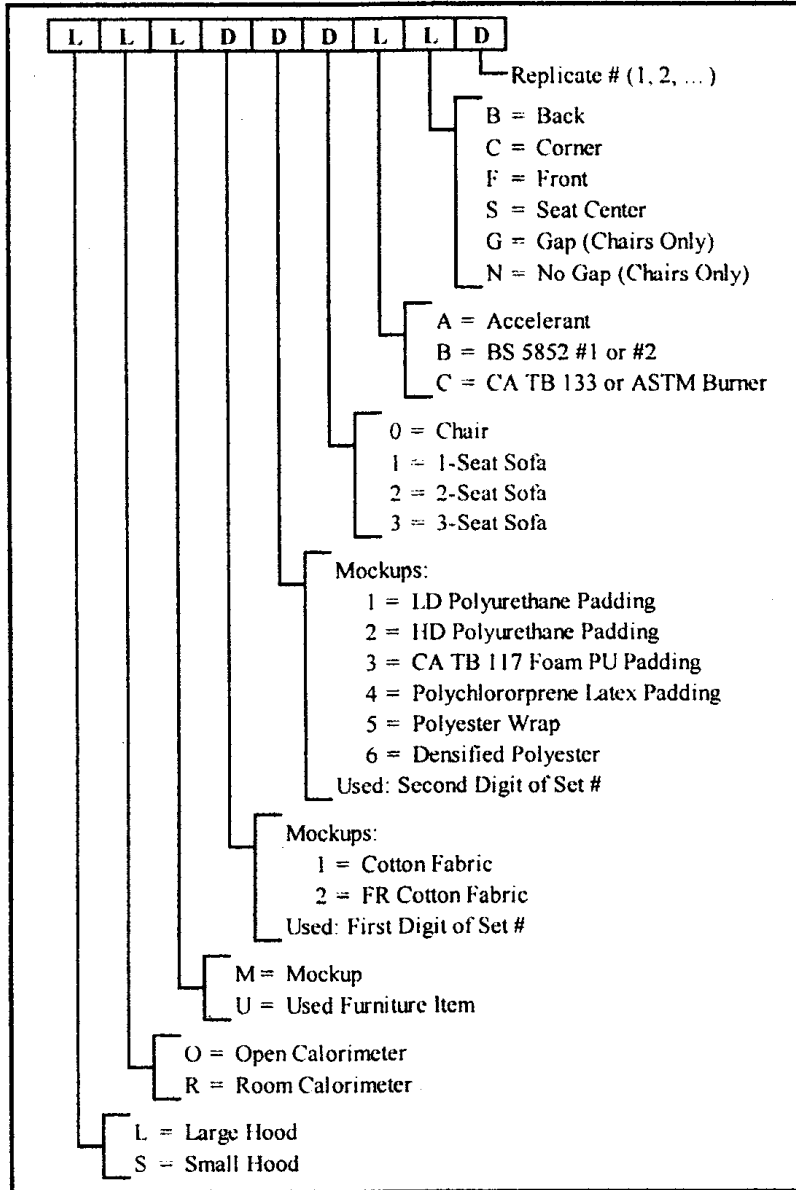
Results and Discussion

A direct comparison of four conditions shows the applicability of having a flame-retardant requirement for home furnishings. The heat release rates measured over the duration of the test are shown in the four pairs of graphs below. The conditions are:

- a flammable cover over urethane foam;
- a flame-retardant cover over urethane foam;
- a flammable cover over flame-retardant foam; and
- a flame-retardant cover over flame-retardant foam.

Table 4 provides the sample identification description dictionary that defines the test performed and material types. This can be used to show the materials of composition, test conditions, ignition source and ignition location.

TABLE 4.—System for Composing and Deciphering the Test II String



A comparison of one cushion mockups with low-density nonflame-retardant and flame-retardant urethane foams shows a reduction in the heat released. These two examples both have flammable covers. Comparing the time to fully involved fire environment, the peak HRR and the total heat released (area under the curve), show that the fire-resistant foam slows the onset of free-burning fire by more than doubling the time from ignition to peak HRR (pHRR). The blue plot in both Figures

5 and 6 is the experimental data for these two conditions. All of the other plots are fire-spread models attempting to predict the fire growth. The nonflame-retardant foam seat ignites and reaches free burning in approximately 400 s. The CA TB 117 foam requires 1,000 seconds to achieve pHRR. The pHRR and total heat released are also one-half for the CA TB 117 foam when compared to the nonflame-retardant foam. These tests used the small-flame ignition source. There are several examples of this exact relationship in Janssens work.

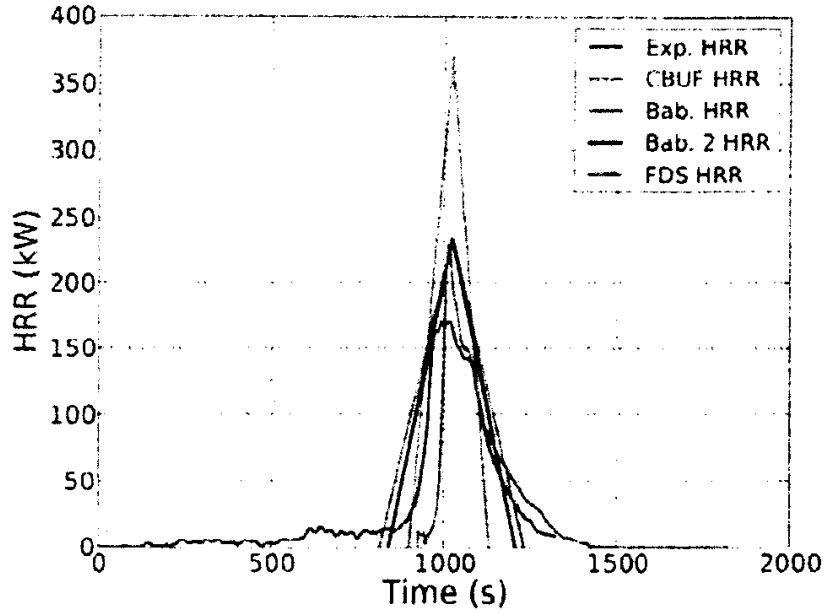


FIGURE 5.—SRM131BB2—CA TB 117 Urethane Foam With Flammable Cover

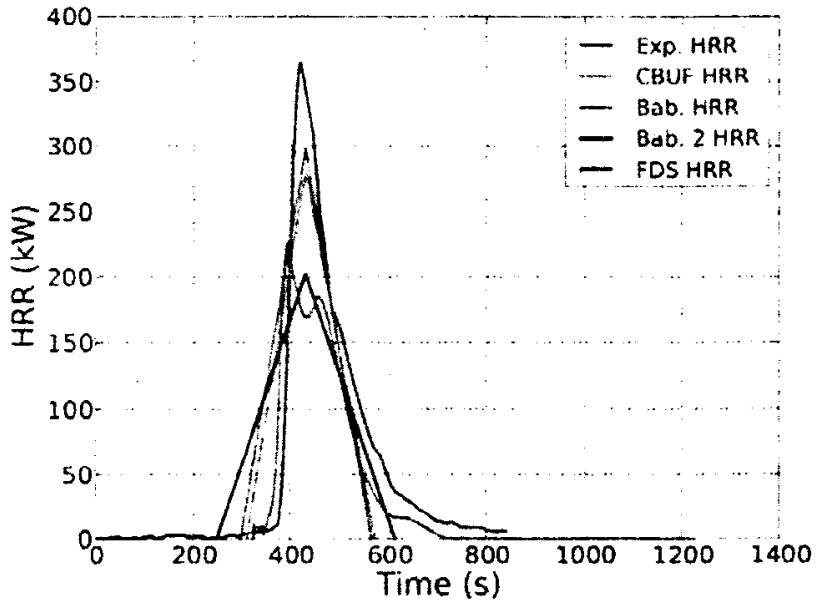


FIGURE 6.—SR1V1111BS1—Low-Density Urethane Foam With Flammable Cover

Comparing the material cover of furniture mockups illustrates the utility of using NFPA 701 rated fabrics as covers for foam-filled furnishings. The blue plots in Figures 7 and 8 illustrate the impact of using a flame-retardant fabric over high-density foam of the same manufacturing lot using the same ignition source and location. Again the time from ignition of the couch to the free-burning state is significantly delayed. The unprotected foam goes to a free-burning state upon ignition. The foam protected with the NFPA 701 fabric shows a delay of 10 minutes to reach the same condition. It is also important to note that the pHRR is half the intensity for the flame-retardant case with 220 kW for the FR fabric compared to 440 kW for nonflame-retardant fabric. The total energy released by both events is approximately the same. This series of test used the large burner igniter shown in Figure 2. Use of the small burner BS5852 failed to ignite the flame-retardant test item.

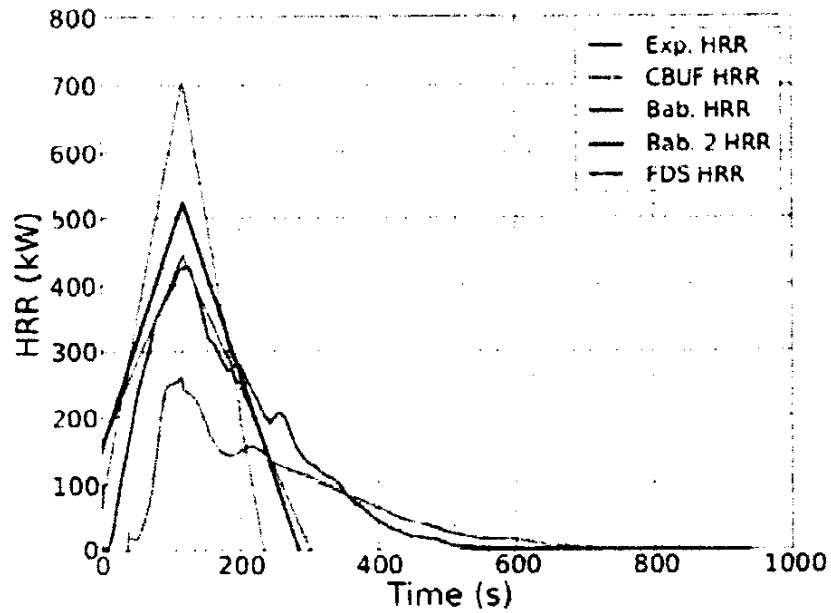


FIGURE 7.—SOM121CS4

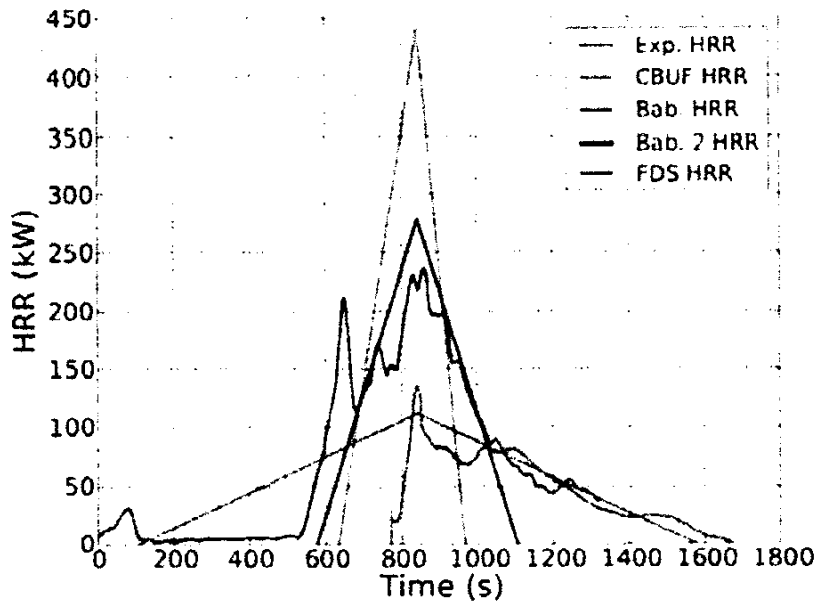


FIGURE 8.—SOM221CS1

The defense in depth approach of using both an flame-retardant fabric and CA TB 117 foam hugely impacts the fire event. Figures 9 and 10 compare the cases of

three cushion couch mockups with and without FR foams IAW CA TB 117 and NFPA 701 covers. These figures show that with the large burner the protected couch failed to ignite while the unprotected couch reaches free burning in 180 s. The unprotected couch would cause the room to reach flashover in 4 minutes.

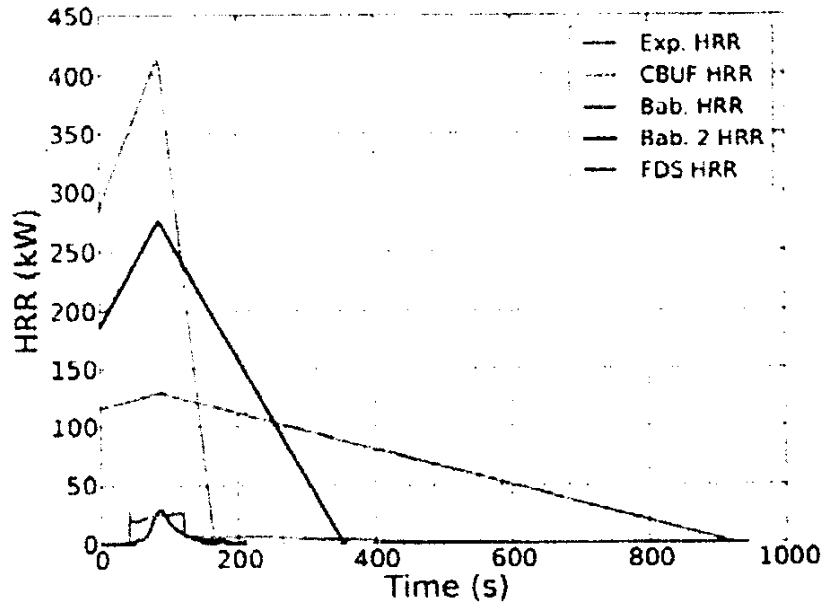


FIGURE 9.—SRM233CS1

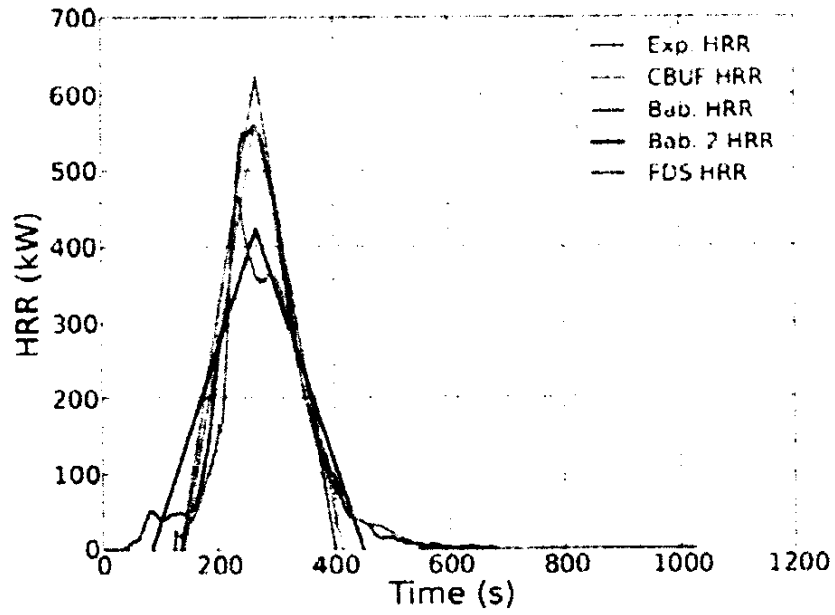


FIGURE 10.—LRM113CF1

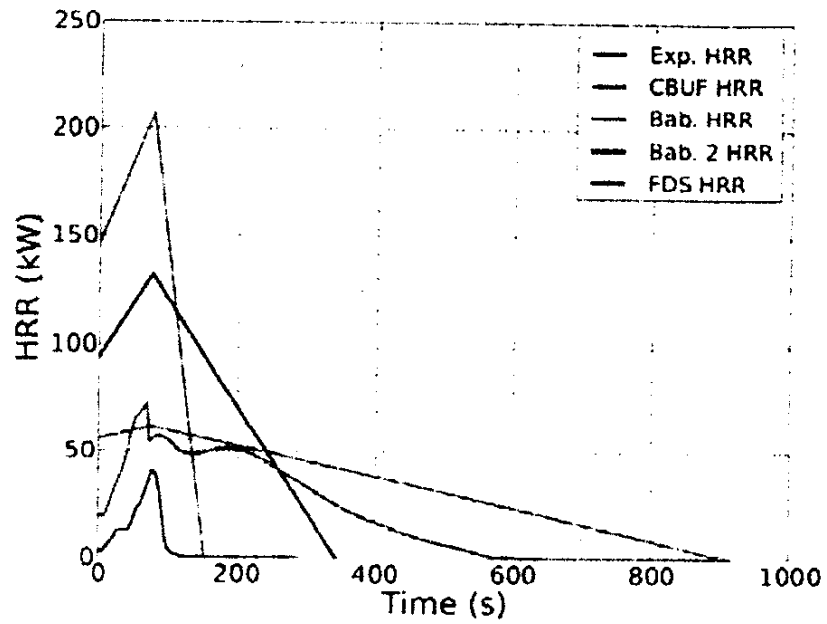


FIGURE 11.—SOM231CS1

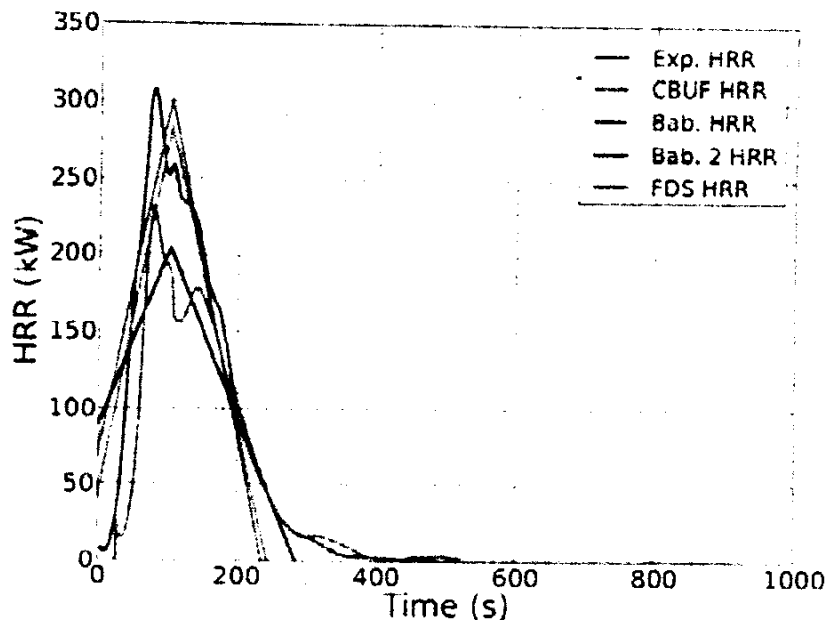


FIGURE 12.—SOM111CS1

Figures 11 and 13 show the same comparison for a single seat chair. The same no-ignition is seen for the CA TB 117 and NFPA 701 compliant cushion compared to rapid ignition of the unprotected cushion. The ignition time for the case was even more rapid for this unprotected furnishing due to the location of the ignition source.

Conclusion

The best conclusion that can be drawn from the data presented here is that the use of CA TB 117 foam increases the fire safety of home furnishings by delaying the onset of free-burning conditions and reducing the total energy released by the event. Using a NFPA 701 compliant cover over the flame-retardant foam prevents the furnishing from becoming the point of initiation with numerous examples in Janssen's paper self-extinguishing on removal of the ignition source, videos of these comparisons are available on request. What CA TB 117 does not do is prevent the furnishing from burning where there is already a free-burning environment but that is not the intent of the regulation. The intent is to prevent the furnishing from becoming the initiation point of a large, free-burning fire caused by a small ignition source that could lead to trapping of occupants by preventing escape.

DR. MATTHEW S. BLAIS,

Director, Fire Technology Department, Southwest Research Institute.

Senator DURBIN. Senator Lautenberg.

STATEMENT OF SENATOR FRANK R. LAUTENBERG

Senator LAUTENBERG. Thanks, Mr. Chairman, for holding this hearing.

Parents in this country expect their child to be safe when sleeping on a baby mattress, feeding from a bottle, playing on the furniture.

When parents buy products that their kids will use, they assume that any chemicals in those products have been tested and proven safe and effective.

In many countries around the world, chemicals are required to be tested, but not in the United States. That's because a 35-year-old law that's supposed to assess and protect against chemical health risks is broken.

The Government Accountability Office has placed that law, TSCA, on its list of high-risk areas of the law. And the President's cancer panel, led by experts appointed under President Bush, said that TSCA, "may be the most egregious example of ineffective regulation of environmental contaminants."

Today, thank goodness, we're examining a prime example of why our system for regulating chemicals needs to be updated.

This spring, the Chicago Tribune exposed how the chemical industry has used dirty tricks and junk science to drive a public misinformation campaign that keeps chemical flame retardants in our homes.

The Chicago Tribune reported that many chemical flame retardants are highly toxic. And while industry has promised that flame retardants would stay put in our furniture, pose no threat to health, those chemicals have ended up everywhere, including in children's bodies. According to the Chicago Tribune, "a typical American baby is born with the highest recorded concentration of flame retardants among infants in the world."

The series shows how the industry repeatedly bullied and lied to the State legislatures to prevent common-sense reforms. They've been accused of bankrolling so-called experts to invent stories that spout the company line, all in the service of protecting their profits, and all at the expense of our safety and health.

But here are the facts: The average couch contains more than 2 pounds of flame-retardant chemicals—chemicals linked to cancer and other health risks.

And while we have filled our homes with toxic chemicals, these flame retardants don't even do what they're meant to do, and that's to prevent fires.

And that's why Senator Snowe and I recently sent a bipartisan letter to EPA, signed by 24 of our Senate colleagues, including Chairman Durbin, urging the agency to take action on a class of flame retardants. Our letter also called for real reforms to TSCA.

But I want to be clear: Flame retardants are just the tip of the iceberg. Studies by the Centers for Disease Control (CDC) scientists found 212 industrial chemicals, including 6 carcinogens, coursing through American bodies. In nearly 35 years, TSCA has allowed EPA to require testing of only 200 of more than 80,000 chemicals on EPA's inventory.

What's more, EPA has been able to ban only five toxic substances under the law. In essence, the American public has become a living, breathing repository for chemical substances.

Our TSCA reform bill, the Safe Chemicals Act, will simply require the chemical makers to establish product safety before they end up in children's bodies.

And most of the thousands of chemicals we use every day are safe, but this bill will separate those safe chemicals from the ones that are not. That's what we have to look out for.

It will ensure that chemicals are tested, that EPA can take unsafe uses of the chemicals off the market.

And I'm proud that Chairman Durbin and 20 other Senators have cosponsored the bill. And I hope that all of our colleagues will come together to finally fix this law to protect our families and our kids from toxic chemicals.

Senator DURBIN. Thanks, Senator Lautenberg.

First panel, Inez M. Tenenbaum, who is the Chairman of CPSC, please proceed.

STATEMENT OF INEZ M. TENENBAUM, CHAIRMAN, CONSUMER PRODUCT SAFETY COMMISSION

Ms. TENENBAUM. Chairman Durbin, Ranking Member Moran, and Senator Lautenberg, I'm pleased to be here today to discuss CPSC's current efforts to implement the performance requirement to reduce the fire risk of residential upholstered furniture.

Reducing deaths and injuries in residential fires is a key strategic goal of CPSC, and the flammability of upholstered furniture has been an area of significant concern by the commission staff.

On March 4, 2008, CPSC issued a notice of proposed rulemaking for a standard for flammability of residential upholstered furniture. The proposed standard would establish two possible pathways for upholstered furniture to meet the proposed standard: Manufacturers could either use an upholster cover material that complies with the prescribed smoldering resistance test, referred to as type one furniture, or use an interior fire barrier that complies with specific smoldering and open flame-resistance tests, known as type two furniture.

During the development of the notice of proposed rulemaking (NPR), CPSC staff was highly cognizant of the concerns expressed by many stakeholders over the use of flame-retardant chemicals as a part of any standard.

While EPA has primary jurisdiction over flame-retardant chemicals through TSCA, CPSC's proposed rule has a performance-based standard as noted above. It does not specify any particular materials or designs, and it does not require the use of any flame-retardant chemicals to achieve compliance with the proposed standard.

In this regard, the proposed rule's open-flame barrier requirement is consistent with certain preliminary findings in a CPSC staff report, conducted as part of the research on the upholstered furniture rule, which reviewed the effects of certain fire barriers on the flammability of upholstered chairs.

The foam used under the fire barriers in those tests represented both flame-retardant-treated foam and nonflame-retardant-treated foam. At the conclusion of these tests, staff noted that the addition of a fire barrier markedly increased the safety of the furniture. As a part of the testing, staff also noted that the fire-retardant foams did not offer a practically significant greater level of open-flame safety than the untreated foam.

Since issuance of the NPR in 2008, CPSC staff has worked diligently with stakeholders and other interested parties to finalize the rule and conduct associated testing. In doing so, we have faced several significant challenges.

One substantial challenge CPSC staff has faced is the development of reasonable and repeatable testing requirements to ensure

compliance with any new rule. Unlike other products, such as mattresses, furniture comes in a multitude of sizes and shapes, making representative and repeatable testing mechanisms a substantial undertaking.

As part of this proceeding, staff has also been working with other organizations to develop standard reference materials, such as standard test cigarettes and standard test foam, which can be part of a representative and repeatable testing mechanism detailed above.

As Chairman, I have recently allocated substantial additional resources to these efforts, and we're making progress toward these goals.

The second and most significant challenge is the statutory requirement that CPSC issue any flammability standards for fabrics, related materials, or products, including interior furnishing, pursuant to section 4 of the Flammable Fabrics Act (FFA).

Like section 9 of the Consumer Product Safety Act, section 4 of the FFA requires that CPSC make a series of very detailed and onerous findings before a final rule can be issued.

In addition, if there's a relevant voluntary standard that has been adopted and implemented, CPSC must determine that the voluntary standard is not likely to adequately reduce the risk of injury or that substantial compliance with it is not likely.

As part of the Consumer Product Safety Improvement Act of 2008 (CPSIA), the Congress recognized the burden that the CPSC section 9 requirements placed on the Commission's ability to issue mandatory rules protecting the public from a number of potential hazards, and moved to ease this burden in several areas.

One key example is section 104 of the CPSIA, where the Congress gave CPSC streamline authority to adopt new mandatory standards for durable infant and toddler products. Under section 104, CPSC must adopt standards for certain infant and toddler products that are substantially the same as relevant voluntary standards, or more stringent than such voluntary standards, if the Commission determines that more stringent standards would further reduce the risk of injury associated with those products.

This section has allowed CPSC to expeditiously adopt standards protecting infants and young children in durable nursery equipment.

Speaking personally in my capacity as Chairman, I believe that an amendment to the FFA permitting this type of flexibility for rules regarding flammability of upholstered furniture would be very helpful and may allow for expedited consideration of the proposed rule.

PREPARED STATEMENT

Chairman Durbin, thank you again for the opportunity to testify on CPSC's ongoing efforts to address the flammability of residential upholstered furniture.

I'm happy to answer any questions you or Senator Lautenberg might have.

Senator DURBIN. Thanks, Chairman Tenenbaum. I'm sure we will have some.

[The statement follows:]

PREPARED STATEMENT OF INEZ M. TENENBAUM

Good afternoon, Chairman Durbin, Ranking Member Moran, and members of the subcommittee on Financial Services and General Government. I am pleased to be here today to discuss the Consumer Product Safety Commission's (CPSC) current efforts to implement performance requirements to reduce the fire risk of residential upholstered furniture.

Reducing deaths and injuries in residential fires where consumer products play a contributory role is a key strategic goal of CPSC, and the flammability of upholstered furniture has been an area of significant concern by Commission staff. Upholstered furniture in a home is often a major source of combustible fuel for a fire. Once this furniture is ignited, it contains enough fuel to spread a fire very quickly when the upholstery filling materials start to burn.

The most recent fire loss estimates for 2006 through 2008 indicate that upholstered furniture was the first item to ignite in an average of 6,500 residential fires attended by fire services during that period. These fires resulted in more than 500 deaths, 860 injuries, and \$343 million in property loss each year.¹

On March 4, 2008, CPSC issued a Notice of Proposed Rulemaking (NPR) for a "Standard for the Flammability of Residential Upholstered Furniture."² The proposed standard would establish two possible pathways for upholstered furniture to meet the proposed standard. Manufacturers could either use upholstery cover material that complies with a prescribed smoldering resistance test (referred to as Type I furniture) or use an interior fire barrier that complies with specified smoldering and open flame resistance tests (Type II furniture).

During the development of the NPR, CPSC staff was highly cognizant of the concerns expressed by many stakeholders over the use of flame-retardant chemicals as part of any standard. While the Environmental Protection Agency has primary jurisdiction over flame-retardant chemicals under the Toxic Substances Control Act, CPSC's proposed rule has a performance-based standard, as noted above. It does not specify any particular materials or designs, and does not require the use of any flame-retardant chemicals to achieve compliance with the proposed standard.

In this regard, the proposed rule's open-flame barrier requirement is consistent with certain preliminary findings in a CPSC staff report,³ conducted as part of the research on the upholstered furniture rule, which reviewed the effect of certain fire barriers on the flammability of upholstered chairs. The foam used under the fire barriers in those tests represented both flame-retardant-treated and nonflame-retardant-treated foam. At the conclusion of those tests, staff noted that the addition of a "fire barrier markedly increased the fire safety of the furniture."⁴ As part of the testing, staff also noted that "the fire-retardant foams did not offer a practically significantly greater level of open-flame safety than did the untreated foams."⁵

The proposal also aligns with previous CPSC rules regarding the flammability of consumer products, such as CPSC's 2006 final flammability rule for mattresses and mattress foundation sets, which also sets a performance-based standard that does not require the use of flame-retardant chemicals.⁶

Since issuance of the NPR in 2008, CPSC staff has worked diligently with stakeholders and other interested parties to finalize the rule and conduct associated testing. In doing so, they have faced several significant challenges.

One substantial challenge CPSC staff has faced is the development of reasonable and repeatable testing requirements to ensure compliance with any new rule. One component of this is developing appropriate scale tests that can account for the diversity of upholstered furniture products. Unlike other products, such as mattresses, furniture comes in a multitude of sizes and shapes, making representative and repeatable testing mechanisms a substantial undertaking.

As part of this proceeding staff has also been working with other organizations, such as the National Institute for Standards and Technology, to develop standard reference materials, such as standard test cigarettes and standard test foam, which

¹David Miller and Risana Chowdhury, 2006–2008 Residential Fire Loss Estimates, Division of Hazard Analysis, Directorate for Epidemiology, U.S. Consumer Product Safety Commission (released July 2011), *available at* <http://www.cpsc.gov/LIBRARY/fire08.pdf>.

²See Notice of Proposed Rulemaking, Standard for the Flammability of Residential Upholstered Furniture, 73 Federal Register 11702 (March 4, 2008).

³See Memorandum from Shivanti Mehta to Dale R. Ray, "Upholstered Furniture Full Scale Chair Tests—Open Flame Ignition Results and Analysis" (dated May 9, 2012), *available at* <http://www.cpsc.gov/library/foia/foia12/os/openflame.pdf>.

⁴*Id.* at 23.

⁵*Id.*

⁶See Final Rule, Standard for the Flammability (Open Flame) of Mattress Sets, 71 Federal Register 13472 (March 15, 2006); see also 16 CFR 1633.

can be part of the representative and repeatable testing mechanisms detailed above. As Chairman, I have recently allocated substantial additional resources to these efforts and we are making progress towards these goals.

The second and most significant challenge is the statutory requirement that CPSC issue any flammability standards for fabrics, related materials, or products including interior furnishings pursuant to section 4 of the Flammable Fabrics Act (FFA).⁷ Like section 9 of the Consumer Product Safety Act, section 4 of the FFA requires that CPSC make a series of very detailed and onerous findings before a final rule can be issued, including determinations that the standard is “needed to protect the public against unreasonable risk of the occurrence of fire leading to death or personal injury, or significant property damage”; that expected benefits from the regulation bear a reasonable relationship to its costs; and that the regulation is the least burdensome alternative that prevents or “adequately reduces” the risk of injury. In addition, if there is a relevant voluntary standard that has been adopted and implemented, CPSC must determine that the voluntary standard is not likely to adequately reduce the risk of injury or that substantial compliance with it is not likely.

As part of the Consumer Product Safety Improvement Act of 2008 (CPSIA), the Congress recognized the burden that CPSA section 9 requirements placed on CPSC’s ability to issue mandatory rules protecting the public from a number of potential hazards, and moved to ease this burden in several areas. One key example is section 104 of the CPSIA, where the Congress gave CPSC streamlined authority to adopt new mandatory standards for durable infant and toddler products.

Under section 104, CPSC must adopt standards for certain infant and toddler products that are “substantially the same as” relevant voluntary standards or “are more stringent than such voluntary standards, if CPSC determines that more stringent standards would further reduce the risk of injury associated” with those products. This section has allowed CPSC to expeditiously adopt standards protecting infants and young children in cribs, play yards, bath seats, walkers, and toddler beds. Speaking personally in my capacity as Chairman, I believe an amendment to the FFA permitting this type of flexibility for rules regarding flammability of upholstered furniture would be very helpful and may allow for expedited consideration of the proposed rules.

Chairman Durbin, thank you again for the opportunity to testify on CPSC’s ongoing efforts to address the flammability of residential upholstered furniture.

I am happy to answer any questions you may have.

Senator DURBIN. And now let me introduce James J. Jones, Acting Assistant Administrator of the Office of Chemical Safety and Pollution Prevention at EPA.

Please proceed.

STATEMENT OF JAMES J. JONES, ACTING ASSISTANT ADMINISTRATOR, OFFICE OF CHEMICAL SAFETY AND POLLUTION PREVENTION, ENVIRONMENTAL PROTECTION AGENCY

Mr. JONES. Good afternoon, Chairman Durbin and Senator Lautenberg.

Thank you for the opportunity to address you on the reform of chemicals management, and our authority to assess the safety of flame-retardant chemicals.

Ensuring chemical safety, maintaining public confidence that EPA is protecting the American people, and promoting our global leadership in chemicals management remain top priorities for EPA and Administrator Jackson.

Chairman Durbin and Senator Lautenberg, I want to thank you both as well for your continued leadership on this important issue and the efforts you’ve brought about to help reform TSCA. I also want to thank Chairman Tenenbaum for her work on flame retardants.

With each passing year, the need for TSCA reform grows. Chemicals are found in most everything we use and consume, and they’re

⁷ 15 U.S.C. 1193.

also essential for our health, our well being, and our prosperity. It should be equally essential that chemicals are safe.

But I'd also like to discuss a prime example of the shortcomings of TSCA that stands as a clear illustration for the need for TSCA reform.

So what are the key problems with TSCA? When enacted, TSCA grandfathered in—without any evaluation—the 62,000 chemicals in commerce that existed in 1976. The TSCA inventory currently lists more than 84,000 chemicals, few of which have been studied for their risks, especially to children.

Unlike the laws applicable to drugs and pesticides, TSCA does not have any mandatory program where EPA must conduct a review to determine the safety of existing chemicals. Manufacturers do not need to demonstrate the safety of new chemicals before they are introduced into the marketplace. When EPA determines that a chemical poses a significant health concern, taking action under TSCA to limit or ban a chemical is challenging.

In September 2009, EPA Administrator Lisa Jackson announced a set of administration principles to update and strengthen TSCA. These principles include that manufacturers should provide EPA with the necessary information to conclude that new and existing chemicals are safe.

EPA should have the tools to quickly and efficiently obtain information from manufacturers that is relevant to determining the safety of chemicals. EPA should also have clear authority to assess chemicals against the safety standard and to take risk management actions when chemicals do not meet safety standards. These are three of the key principles and there are several others.

While the legislative reform process is underway, we are not just standing by. EPA is utilizing the current authority under TSCA to help protect human health and the environment.

Earlier this year, we developed a screening process to identify chemicals for review based on their hazard, exposure, persistence, and bioaccumulative characteristics. EPA identified 83 chemicals for risk assessment with an initial 7 for assessment in 2012.

In June of this year, we identified an additional 18 chemicals that the agency intends to review and then develop risk assessments in 2013 and 2014, including 3 flame-retardant chemicals.

EPA's experience with one flame retardant in particular highlights the limitations of TSCA. EPA first reviewed a new flame-retardant component, TBB, in several products in 1995 for use in foam and, at that time, was unable to identify that it was persistent and bioaccumulative. We only learned of these properties after the chemical was in commerce and was later found in humans and the environment.

TBB is one of the flame retardants EPA will evaluate in 2013, 18 years after it was introduced into the market.

This is an example that highlights the critical need for the agency to have greater evidence that new chemicals are safe prior to commercialization and stronger tools to take action after they are on the market to ensure safety.

The American public has the right to expect that chemicals manufactured, imported, and used in this country are safe. And the

EPA needs an effective law that gives us the tools necessary to provide the public with this assurance.

PREPARED STATEMENT

TSCA must be updated and strengthened, so that EPA has the tools to do the job of protecting public health and the environment. And the time to fix this badly outdated law is now.

And I would be pleased to answer any questions you have.
[The statement follows:]

PREPARED STATEMENT OF JAMES J. JONES

Good afternoon Chairman Durbin, Senator Lautenberg, and members of the subcommittee. Thank you for the opportunity to address the subcommittee today on the reform of chemicals management in the United States and the Environmental Protection Agency's (EPA) authority to assess the safety of flame-retardant chemicals under the Toxic Substances Control Act (TSCA). Ensuring chemical safety, maintaining public confidence that EPA is protecting the American people, and promoting our global leadership in chemicals management remain top priorities for EPA and Administrator Lisa P. Jackson.

Chairman Durbin and Senator Lautenberg, I want to thank you both, as well as members of this subcommittee for your continued leadership on this very important issue and your efforts to bring about reform of TSCA. With each passing year, the need for TSCA reform grows—the importance and prevalence of chemicals in our daily lives increases, and yet there remain significant gaps in our knowledge and understanding of many of these chemicals. The time to bring TSCA into the 21st century is long overdue. Today, we also want to discuss a prime example of the shortcomings of TSCA—the limited success and long history of the EPA's work on brominated flame retardants—that stands as a clear illustration of the need for TSCA reform.

Chemicals are found in most everything we use and consume, and can be essential for our health, our well being, and our prosperity. It should be equally essential that chemicals are safe. Compared to 30 years ago, we have a better understanding of the environmental impacts, exposure pathways, and distressing health effects some chemicals can have—especially on children. While our understanding of chemical safety is constantly evolving, significant gaps in our scientific knowledge regarding many chemicals remain. For these reasons, it is critical that we close those knowledge gaps. Recent press reports on flame retardants highlight the public health risks posed by certain chemicals such as flame retardants. Public understanding of these risks is growing, and that is why the public is increasingly demanding that the Government provide an assurance about chemicals, even chemicals like flame retardants that can also provide significant benefits. To date, based on these concerns, EPA helped negotiate voluntary phase-outs of several of the more toxic retardants, and has also initiated regulatory actions; however, as explained in more detail below, TSCA reform would have given EPA additional tools to address this serious issue.

BACKGROUND ON THE TOXIC SUBSTANCES CONTROL ACT

EPA's chemical management authority is carried out under TSCA—a law that when enacted in 1976 was an important step forward to protect human health and the environment. But today, TSCA is the only major environmental statute that has not been reauthorized. Over the years, not only has TSCA fallen behind the rapidly advancing industry it is intended to regulate, it has also proven an inadequate tool for providing the protection against chemical risks that the public rightfully expects and deserves.

When TSCA was enacted, it grandfathered in, without any evaluation, the 62,000 chemicals in commerce that existed in 1976. The TSCA inventory currently lists more than 84,000 chemicals, few of which have been studied for their risks, especially to children. Unlike the laws applicable to drugs and pesticides, TSCA does not have a mandatory program where EPA must conduct a review to determine the safety of existing chemicals.

And the process of requiring testing through rulemaking chemical-by-chemical has proven time consuming. As a result, in the 35 years since TSCA was passed, we have only been able to require testing on approximately 200 of the 84,000 chemicals listed on the TSCA inventory. EPA has also relied on voluntary programs to collect

data, including through the High Production Volume (HPV) Challenge Program, which resulted in the submittal of screening level data for 1,366 HPV chemicals.

When EPA determines that a chemical poses a significant health concern, taking action under TSCA to limit or ban a chemical is challenging. For example, in 1989, after years of study and nearly unanimous scientific opinion, EPA issued a rule phasing out most uses of the cancer causing substance asbestos. Yet, a Federal court overturned most of this action because EPA failed to clear the hurdles imposed under TSCA before existing chemicals can be controlled.

Today, advances in toxicology and analytical chemistry are enhancing our understanding of the implications of multiple pathways of exposure, and a better understanding of the cumulative effects and interactions between the chemicals in the products we use every day. EPA is working to develop methodology to address potential health effects of multiple chemical exposures and evaluate cumulative risks. When TSCA was enacted, there was not the understanding of the subtle effects chemicals may have on hormone systems, human reproduction, and intellectual development and cognition, particularly in young children.

ESSENTIAL PRINCIPLES FOR REFORM OF CHEMICALS MANAGEMENT LEGISLATION

In September 2009, EPA Administrator Jackson announced a set of administration principles to update and strengthen TSCA. These include that EPA should have the tools to quickly and efficiently obtain information from manufacturers that is relevant to determining the safety of chemicals. EPA also should have clear authority to assess chemicals against a safety standard and to take risk management actions when chemicals do not meet the safety standard.

At the same time, Administrator Jackson also affirmed that, while the legislative reform process is underway, EPA is committed to utilizing the current authority under TSCA to the fullest extent to protect human health and the environment.

WORK PLAN CHEMICALS

Earlier this year, EPA developed a screening process to identify chemicals for review based on their combined hazard, exposure, and persistence and bioaccumulation characteristics. This process included criteria specifically targeted at identifying chemical risks to children. Following this initial screen, EPA identified 83 work plan chemicals for risk assessment in the TSCA chemicals management program, with an initial seven for risk assessment in 2012.

On June 1, 2012, EPA identified an additional 18 chemicals that the Agency intends to review and then develop risk assessments in 2013 and 2014, including 3 flame-retardant chemicals—Bis(2-Ethyl hexyl)-3,4,5,6-tetrabromophthalate (TBPH), 2-Ethyl hexyl-2,3,4,5-tetrabromobenzoate (TBB), and Tris(2-chloroethyl)phosphate (TCEP). EPA is currently developing a strategy, scheduled for completion by the end of this year that will address these three and a broader set of flame-retardant chemicals. This effort will assist EPA in focusing risk assessments on those flame-retardant chemicals that pose the greatest potential concerns. EPA anticipates initiating the risk assessments on this category of chemicals in 2013.

POLYBROMINATED DIPHENYL ETHER FLAME-RETARDANT CHEMICALS

EPA is concerned that polybrominated diphenyl ethers (PBDEs) are persistent, bioaccumulative, and toxic to both humans and the environment. A critical endpoint of concern for human health is neurobehavioral effects during development, which makes them a concern for children's health. Various PBDEs have also been studied for ecotoxicity in mammals, birds, fish, and invertebrates. In some cases, current levels of exposure for wildlife may be at or near adverse effect levels.

PBDEs are not chemically bound to plastics, foam, fabrics, or other products in which they are used, making them more likely to leach out of these products. Despite the U.S. phasing out the manufacture and import of penta- and octaBDE in 2004, their component congeners PBDEs are still being detected in humans and the environment. Some reports indicate that levels are increasing.¹ One potential source is imported articles to which these compounds have been added. Another is the breakdown of decaBDE in the environment to more toxic and bioaccumulative PBDE congeners. In late 2009, the U.S. manufacturers of decaBDE announced that they intend to voluntarily phase out most uses of decaBDE by the end of 2013.

¹ Shaw SD, Kannan K. 2009. Polybrominated diphenyl ethers in marine ecosystems of the American continents: foresight from current knowledge. *Rev Environ Hlth* 2009, 24, 157–229

EFFORTS ON POLYBROMINATED DIPHENYL ETHER FLAME-RETARDANT CHEMICALS

In late 2009, EPA released an Action Plan for addressing concerns with PBDE flame-retardant chemicals and recently issued proposed rules that would require additional testing on these chemicals and require EPA review any new uses of these chemicals, including imported articles. EPA also helped facilitate an industry plan to phaseout decaBDE and launched a multi-stakeholder partnership to assess alternatives for this chemical to help move the market to safer chemicals. This follows EPA's earlier facilitation of an industry phaseout of two other widely used PBDE flame retardants, pentaBDE and octaBDE in 2004 and an associated partnership to help identify safer flame retardants for use in polyurethane foam.

In its 2009 Action Plan, EPA committed to support and encourage the voluntary phase out of the manufacture and import of decaBDE. Developed with public participation through EPA's Design for the Environment Program, EPA will shortly release the draft alternatives assessment on decaBDE for public comment. This assessment will profile the environmental and human health hazards on 30 alternatives to decaBDE. By providing a detailed comparison of the potential human health and environmental effects of chemical alternatives, EPA can help manufacturers identify and transition to safer alternative flame-retardant chemicals.

EPA first reviewed a new flame-retardant component of several products in 1995 for use in polyurethane foam and was unable to identify that a component of flame retardants was persistent, bioaccumulative and toxic. Later, after the chemicals were in commerce, information became available that showed the chemicals were being found in humans and the environment. This is an example that highlights the critical need for the agency to have greater evidence that new chemicals are safe prior to commercialization and to be able to take effective action after commercialization, when needed. Unfortunately, taking the necessary steps to ensure that chemicals already in commerce are safe can be a cumbersome, involved regulatory process that can take years.

While the latest steps taken by EPA are clearly a step forward, they must be viewed in the context of what has been a long history of actions on flame retardants, a history that has stretched over the course of two decades with a range of voluntary efforts and regulatory actions on flame-retardant chemicals in both EPA's new and existing chemicals programs. The long history of EPA's action on brominated flame retardants is tied in no small part to the shortcomings of TSCA.

SUMMARY

Simply put, EPA may have made a different determination in 1995 if TSCA required the submission of more robust hazard, exposure, and use data needed to adequately assess risk, and EPA may have been able to act more quickly and effectively on the risk information available if TSCA provided more robust tools to deal with chemicals already introduced into commerce. The American public has the right to expect that the chemicals manufactured, imported, and used in this country are safe and EPA needs an effective law that gives us the tools necessary to provide the public with this assurance. The time is now to fix this badly outdated law. TSCA must be updated and strengthened so that EPA has the tools to do our job of protecting public health and the environment.

I would be happy to answer any questions you may have.

Senator DURBIN. Thank you very much.

Chairman Tenenbaum.

Ms. TENENBAUM. Yes.

Senator DURBIN. You mentioned that the NPR was announced in March 2008, which was—what?—4 years ago. But, actually, didn't CPSC begin the rulemaking process under the Flammable Fabrics Act in 2003?

Ms. TENENBAUM. Yes, we have a long history of rulemaking in this regard. And, really, it began even before then when CPSC, at the time, asked the staff to develop an open-flame upholstered furniture rule.

And then in 1999, the Congress asked CPSC to study flame-retardant chemicals. We studied 16 chemicals. We worked with the National Academy of Sciences, and eight of those flame-retardant chemicals were found to be carcinogens.

So this has gone on for some time with the work on carcinogens. Now the new rule we're working on is a smoldering ignition rule and not an open flame.

Senator DURBIN. So let me just ask, the average person on the street, if you said to them, we have a Government agency, which is funded, with experts and laboratories, and we've asked them to figure out how to keep our furniture safe so it is less likely to catch fire, and less likely to kill us, they've been at it now for 9 years, make that 4 years.

Ms. TENENBAUM. We've been at it, yes, for at least that long.

Senator DURBIN. And the obvious question from the person on the street is, when does this end? At one point you said to me that the cigarette you were using, Pall Malls, were no longer made, so you had to start over or find a new standard cigarette.

I think here's the way I'm coming at it. I look at UL. I subscribe to "Consumer Reports". They're testing constantly. And they apparently come up with timely results.

Is the Congress the problem here? Have we created obstacles for you in this testing process, where you can't come to a timely finding that might be of value to consumers across America?

Ms. TENENBAUM. I think that the Flammable Fabrics Act places an onerous burden on CPSC with cost-benefit analysis. Not only do we have to look at and analyze what we're going to put in a rule, we have to analyze the alternatives and why they won't work.

So we did have a setback with Pall Mall, because they stopped manufacturing the filterless cigarette, when they were required by law to manufacture self-extinguishing cigarettes and stop making the filterless cigarette that we used as standard reference material.

So we worked with the National Institute of Standards and Technology (NIST) for 2 years, and now they have a standard cigarette. The next thing we had to do—

Senator DURBIN. Two years.

Ms. TENENBAUM. Two years.

During this time period, they were also working on standard foam. A rule requires a test that's repeatable. So NIST has been working on standard foam, and they have finished that work. And we're looking at whether we should use small-scale tests vs. full-scale tests. This model is small-scale testing. This is how we test. This is the foam. You put the cigarette right here. You cover it up.

You have to determine: Is this repeatable with this size or do you have to do full scale? You must test the number of furniture designs, the number of different fabrics, and you had to have a standard cigarette, and standard foam. So we have now completed all that work.

But let me say one thing—

Senator DURBIN. I want to make a point here, if I might.

Ms. TENENBAUM. Please.

Senator DURBIN. I guess the obvious question most people would ask is, how can we have reached the point where Europe has figured this out, or at least believes they have, and we are still testing away here?

Many European countries have taken steps to ensure flammability standards. The United Kingdom has banned the use of con-

ventional flexible polyurethane foam in the manufacture of upholstered furniture.

[The information follows:]

While it is true that in the United Kingdom, there are furniture and bedding flammability standards, flexible polyurethane foam has not been banned in the United Kingdom or anywhere in the world. Complying with U.K. standards requires the addition of substantial amounts of flame-retardant chemicals to polyurethane foam, usually in the form of melamine with a chlorinated "carrier", such as Tris (1-chloro-2-propyl) phosphate. Nonflame-retardant foams do not work in testing standard applications such as British Standard 5852. Other European countries do not have similar flammability standards. Some of the Scandinavian countries, such as Norway, are pursuing development of a flammability standard; however, none has adopted one yet.

At the most recent EUROPUR meetings in Budapest, Hungary in June 2012 (EUROPUR is the European equivalent of the Polyurethane Foam Association), flammability issues were discussed with representatives from many European countries and heard a presentation regarding the efforts in Scandinavian countries to address the impact of adopting upholstered furniture flammability standards. It was in this presentation that the discussion took place regarding the efforts in Norway to establish a furniture flammability standard and the difficulties faced in deciding whether to adopt a standard. European countries are struggling with the same issues as we are in the United States regarding upholstered flammability furniture standards.

Senator DURBIN. In addition, many European countries have banned the use of PDBEs and greatly restricted other flame-retardant chemicals.

It appears that there is a body of study and investigation that is taking place in other countries, leading them to change the products that consumers have available, and the United States just keeps studying away.

Now I know from the congressional side of this that the industry will come in whenever there's an effort to regulate and have oversight, and create what they consider to be safeguards for their products.

But ultimately, at the end of the day, it seems to me that the losers are the American consumers. They don't know what's right, what's safe, and we're not doing our job for them.

Ms. TENENBAUM. CPSC does not require flame retardants for any of the textiles or furniture that we oversee.

We do not advocate for flame retardants. We don't require flame retardants to meet any of our standards. So comparing us to Europe or to California is really not a fair comparison, because we don't require flame retardants to meet any of our standards.

Senator DURBIN. But, Chairman Tenenbaum, what I did note was that there was a change in the type of furniture that is sold in Europe, too, beyond the flame-retardant chemicals.

I see my time is up, and I want to give Senator Lautenberg a chance to ask.

We're going to face a rollcall vote soon.

Go ahead.

Senator LAUTENBERG. Thanks.

Ms. Tenenbaum, nice to see you here and listen to what each of you have said.

And, Mr. Jones, Senator Snowe, and I recently, as I mentioned, sent a letter to EPA signed by 24 of our Senate colleagues, applauding EPA's current actions on polybrominated diphenyl ethers (PBDEs). The letter also expressed concern that EPA's authority to

address PBDEs is limited under our current chemical safety law, TSCA.

[The information follows:]

UNITED STATES SENATE,
Washington, DC, July 9, 2012.

Hon. LISA P. JACKSON, Administrator,
Environmental Protection Agency,
Washington, DC.

DEAR ADMINISTRATOR JACKSON: We are writing to express our support for the Environmental Protection Agency's (EPA) actions to address a class of flame retardant chemicals called polybrominated diphenyl ethers (PBDEs). These flame retardant chemicals are found in a number of everyday consumer products, including furniture, plastics, and even baby products. According to the EPA, these toxic chemicals are suspected to cause cancer and have been linked to serious neurological and reproductive diseases. We urge the agency to move forward as quickly as possible with its current efforts to protect American families from the toxic effects of PBDEs.

PBDEs are mixed into a number of household products in order to raise the temperature at which they burn, purportedly making the products more flame resistant. However, the Consumer Product Safety Commission found that these chemicals do not provide any significant protection against the risk of fires. Instead, it has become clear that PBDEs can increase human health risks and that the chemicals easily spread and accumulate in the environment and living organisms, including people.

We are deeply alarmed that peer-reviewed research has found that a typical American baby is born with the highest recorded concentrations of flame retardants among infants in the world. This is a serious threat to our children's health because PBDEs interfere with the body's hormone systems, and studies in animals suggest they can cause cancerous tumors, birth defects, and other developmental disorders. Researchers have found that children's exposure comes primarily through household dust, making babies and toddlers particularly vulnerable since they spend a significant amount of time playing on the floor.

Despite the danger to public health, a recent investigative report by the Chicago Tribune revealed that flame retardant manufacturers may have misled the public for decades regarding both the risks and efficacy of these chemicals. Due to industry opposition to common sense reforms at both the Federal and State level that would limit the use of these chemicals, PBDEs and other flame retardants continue to be used in a significant number of everyday products.

In response, EPA has adopted an action plan for PBDEs using its existing authority under the Toxic Substances Control Act (TSCA). This plan reflects the agency's assessment that PBDEs are persistent, bioaccumulative, and toxic to both humans and the environment. Currently, the agency is accepting public comment on two paired rulemakings related to PBDEs. The first action would amend the current Significant New Use Rule (SNUR) to require any manufacturer, importer, or processor of seven different PBDEs, or articles containing them, to submit a notification to EPA at least 90 days before beginning new activities involving these chemicals. The second rulemaking would require those insisting on continuing to use these chemicals to develop the data EPA would need to fully evaluate the health and safety effects of this class of toxic chemicals. We support these efforts and urge EPA to finalize and implement these rulemakings as quickly as possible following the public comment period.

While we commend the EPA for taking steps to address PBDEs, it is concerning that the agency must undertake lengthy rulemaking processes merely to secure additional health and safety data on a chemical of concern and to receive notifications regarding expansions of its uses. Further, EPA is not evaluating steps to actually restrict existing unsafe production and uses of these toxic flame retardants. This reinforces why there is broad agreement that TSCA must be reformed to protect American families from dangerous chemicals in a cost-effective way and we urge you to continue to work with Congress to enact consensus reforms.

Americans deserve to know that the chemicals used in everyday consumer products are safe. EPA's current action to address the health risks of PBDEs is an important first step towards protecting Americans from the risks posed by these pervasive chemicals and we look forward to working with you to enact these reforms.

Sincerely,

Frank R. Lautenberg; Olympia J. Snowe; Richard J. Durbin; Lisa Murkowski; Charles E. Schumer; Susan M. Collins; Ron Wyden; Bernard Sanders; Richard Blumenthal; Al Franken; Joseph I. Lieberman; Patrick J. Leahy; Tom Harkin; Dianne Feinstein; Sheldon White-

house; Kirsten E. Gillibrand; Jeff Merkley; Jon Tester; Jack Reed; Tom Udall; John F. Kerry; Amy Klobuchar; Maria Cantwell; Michael F. Bennet; Daniel K. Akaka; Sherrod Brown.

Senator LAUTENBERG. What additional steps might EPA take to protect American families on PBDEs, if the Congress enacted TSCA reform?

Mr. JONES. Thank you, Senator Lautenberg.

We appreciate the letter of support for the actions that we're taking on the PBDEs. These are a group of flame retardants that are being phased out in the United States, and we're putting into place a backstop, we hope, known as the significant new use rule, that hopefully will keep new manufacturers of PBDEs from potentially other parts of the world from sending those chemicals into the United States.

One of the limitations under existing TSCA is that somebody from another country could bring a significant new use notice to EPA without any data supporting the safety of those compounds. And we, again, at EPA would be confronted with making judgments around these chemicals without any evidence of safety.

Closing that loophole under TSCA reform would be very helpful, which I think has been considered in your Safe Chemicals Act.

It also raises the question of all of the other flame retardants and the provisions that previous versions of the Safe Chemical Act have included, which involve manufacturers having data demonstrates safety of those compounds so that the agency can evaluate their safety, and the tools necessary to manage risks, if risks are unacceptable, would be very useful as well.

Senator LAUTENBERG. Yes, in your written testimony, you say EPA would like to do more to protect the public from the risks of flame retardants, but it is limited, again, by its current authority.

Would additional authority provided—you've looked at my Safe Chemicals Act—allow EPA to better address those risks?

Mr. JONES. Absolutely. The example that I described earlier of TBB, where the manufacturer is not required to provide any information to EPA demonstrating safety, which is a hallmark under the Safe Chemicals Act, would be very important to ensuring that new chemicals are safe.

Giving EPA the authority to get health and safety data for existing chemicals is critically important for our ability to demonstrate the chemicals are safe. And then the tools necessary to effectively manage risks from chemicals when risks are identified is also very important.

So I think all of those elements, which are in the Safe Chemicals Act, are critically important to EPA being able to demonstrate that we have safe chemicals in the United States.

Senator LAUTENBERG. A number of States have banned the use of some toxic flame retardants because of public health concerns. Other States are considering similar actions. Now, if EPA had greater authority under TSCA to address these chemicals, do you think that the States would continue pursuing efforts to ban flame retardants and other chemicals?

Mr. JONES. Thanks, Senator. When I speak with my counterparts in State agencies, those in particular who are active in regulating

chemicals, they are hopeful that EPA is more active in assessment and regulation of chemicals.

They are very constrained in their resources. They are responding to the people of their States. But they really wish EPA would, in my words, occupy the space more effectively.

And I think their sense is that, if we did that, that they would not have to be as active as they have been.

Senator LAUTENBERG. Mr. Chairman, I'll ask one more question.

Ms. Tenenbaum, CPSC has done extensive testing on the flammability of different products. Based on this analysis, do you think that the addition of flame retardants in furniture foam has provided Americans with any significant protection from household fires?

Ms. TENENBAUM. Our tests that we conducted on foam that was treated with flame-retardant chemicals and foam that was not, showed that there was no difference in terms of retarding the flame.

However, if you put a barrier behind the furniture, that has a much more significant result in stopping the fire and retarding the growth of the fire.

So the answer is no.

Senator LAUTENBERG. Yes, thank you.

Thanks, Mr. Chairman.

Senator DURBIN. Senator Lautenberg, you've hit the nail on the head, because if these chemicals don't make our homes safer—and that's what Chairman Tenenbaum has said; I think the UL testimony will back that up as well—the obvious question is, is exposure to these chemicals a danger?

And I think it goes back to a point you made in your opening, Senator Lautenberg: Most Americans incorrectly, falsely, assume that if a product is for sale in the United States, someone who cares for their interest—not an economic interest, but cares for the health interest of Americans—has taken a look at it and said it's safe to sell.

So let's get on the record, here, Mr. Jones. In terms of chemicals used throughout our economy—in this case, furniture in particular—there's no pre-clearance through EPA of these chemicals, is there?

Mr. JONES. Thanks, Senator Durbin.

The manufacturers for a new chemical—a new chemical, not one that was manufactured before 1976—must bring to EPA a notice prior to going to market. They are not required, however, to submit to EPA or to generate any health and safety data unless they already have.

And so EPA uses what knowledge we have to make judgments about whether or not we believe that chemical is going to be safe.

We are significantly limited by what is provided to us by the manufacturers.

Senator DURBIN. So let's do a sharp contrast with another role of our Federal Government.

When it comes to prescription drugs, in order for a company to legally sell prescription drugs in America, they must establish that that compound, that chemical compound, is both safe and effective, safe to the consumer and effective for the purpose sold. And until

they establish that, they cannot legally sell that pharmaceutical in America.

Now, in your world of chemicals, and let's deal with post-1976 after the 67,000, did you say?

Mr. JONES. Right.

Senator DURBIN. That were grandfathered in, when it comes to new chemicals, is there a legal burden on those who introduce them into commerce to establish that they are safe for exposure to human beings, and effective for the purpose stated?

Mr. JONES. There is no legal burden on the manufacturer to demonstrate to EPA or to anyone else that the products that they are going to be selling are safe. They need to submit the name of the chemical and a few other pieces of information to EPA, and the burden is on us to demonstrate that it is not safe.

Senator DURBIN. And you're dealing with 13,000 or 14,000 chemical compounds?

Mr. JONES. There have been more than 26,000 new chemicals since TSCA was originally passed.

Senator DURBIN. And according to Senator Lautenberg and things that I've read, you've been able to look at several hundred. Is that correct?

Mr. JONES. Of existing chemicals, we have required testing of several hundred. We have looked at the 26,000 new chemicals that came to us.

But again, they do not need to submit any health and safety data, unless they already generated it, to EPA. And so we are trying to use our judgment, often in the absence of data, to determine whether or not there's some reason to be concerned.

I think often we do a good job of that. I think TBB is an example of where we missed it. We missed an issue that ultimately—

Senator DURBIN. TBB being a flame retardant.

Mr. JONES. TBB being the flame retardant in Firemaster.

Senator DURBIN. So the premise is, from Chairman Tenenbaum and later from UL, these chemicals do not make us any safer. Number two, these chemicals in and of themselves could cause some health problems.

It's my understanding that scientific data says exposure to flame-retardant chemicals can lead to liver, thyroid problems, cancer, and other developmental defects. Is that not correct?

Mr. JONES. That's correct.

Senator DURBIN. There is no evidence, or there is no requirement, I should say, under the law that they be proven safe before they're introduced into commerce. And now we are finding concentrations in our babies and infants, unlike any other country in the world.

Now, if this isn't a call to arms across America from families, including families with grandparents like me, who have little toddlers now bouncing around on the floor when I'm sitting on these cushions and spraying these chemicals out, I don't know what is.

So at this point, the TSCA law that Senator Lautenberg has introduced, and I'm cosponsoring, would give you new authority in this area, if you could describe it.

Mr. JONES. Thank you, Senator.

The authorities that we would get under the Safe Chemicals Act are the manufacturers would need to have information to demonstrate the safety of the chemicals that they would submit to EPA, and EPA would make a judgment about the safety. So the burden would shift to the manufacturers to demonstrate safety.

For chemicals already on the market, the agency would be able to compel the generation of health and safety data in a way that isn't so burdensome. And then we would also have tools that would allow us to quickly and efficiently remove unsafe uses of compounds from the market.

Senator DURBIN. And just one point I'll make before we break—I think we have to vote, Frank.

One point I'll make is that Firemaster 550, one of these flame-retardant chemicals mentioned in the Chicago Tribune articles, originally developed as an environmentally friendly alternative to PBDEs, the fire-retardant chemicals.

However, new research on Great Lakes fish shows the chemical is accumulating and causing DNA damage to the fish in the Great Lakes.

When TBB, a component of Firemaster 550, was first submitted in 1995, EPA then identified possible negative health impacts of using this chemical. Is that not correct?

Mr. JONES. In 1995, the mistake that the agency made was that we hadn't figured out that that chemical was going to be persistent or bioaccumulative. Those are the properties that have ultimately led TBB to be in the environment in places we never thought it would have been. So it was missing those characteristics, because we had no basis to determine otherwise. That has led to the exposures that you've described.

Senator DURBIN. So it would seem to me interesting that when it comes to the regulation of furniture, products before CPSC, we have created this rigorous set of tests that need to be done by the Government, which make your job that much more difficult and takes that much longer.

And yet when it comes to the chemicals presented by industry to use in American commerce, our standards are very slight reporting of the chemicals themselves and any evidence they've collected. There's a sharp contrast here.

I'm going to ask this subcommittee to stand in recess for about 10 or 15 minutes. We're going to leave and vote and come back.

And Chairman Tenenbaum and Mr. Jones, thank you both for your testimony very much.

We'll have the second panel when we return.

Thank you.

NONDEPARTMENTAL WITNESSES

Senator DURBIN. On our second panel, we're going to hear from three witnesses involved in different parts of the flammability question.

Our first witness is August "Gus" Schaefer, Sr.—vice president and chief safety officer of Underwriters Laboratories (UL), in Northbrook, Illinois, responsible for maintaining and building UL's public safety mission, including planning, directing, and coordinating public safety activities within UL's operations all around the world.

Mr. Schaefer also acts as UL's public safety guardian, ambassador, and advocate inside and outside the company to ensure that public safety remains a key part of UL's relationship with clients and constituents. In this role, he leads the UL Corporate Social Responsibility Initiative.

He's been with them for more than 39 years, holds a bachelor's degree in industrial engineering from NYU School of Engineering and Science and a certificate in management from Long Island's Adelphi University.

Next we're going to welcome Andy S. Counts. He's the CEO of American Home Furnishings Alliance. The American Home Furnishing Alliance is the Nation's largest trade association for home furnishings manufacturers, importers, and suppliers. He's provided a voice on the development and implementation of consensus-based environmental regulations and product safety standards that impact their industry.

He has a degree in industrial engineering from the Georgia Institute of Technology, and he's served in a number of private sector posts, as well as with the Virginia Department of Environmental Quality.

And finally, our third witness is Peter Van Dorpe. He's the chief of the Chicago Fire Department's Training Division. Glad he's here. He is a 32-year veteran of the Chicago Fire Department with a bachelor degree in fire science management from Southern Illinois University.

In addition to his work as field instructor for Illinois Fire Service Institute, he's the lead instructor for the Chicago Fire Department's Fire Officer School, teaches building construction for the Fire Service at Harold Washington College in Chicago, and recently participated as a subject-matter expert for research conducted by both UL and the National Institute of Standards and Technology.

Mr. Schaefer, you have the floor, followed by Mr. Counts, and Mr. Van Dorpe.

Please proceed.

STATEMENT OF AUGUST "GUS" SCHAEFER, SR., VICE PRESIDENT AND CHIEF SAFETY OFFICER, UNDERWRITERS LABORATORIES, INC.

Mr. SCHAEFER. Thank you, Chairman Durbin and members of the subcommittee, for this opportunity to share UL's research and expertise on the subject of furniture flammability.

UL is a global, independent, voluntary standards developer, and product-testing and certification organization dedicated to public safety. We have been based in Illinois since our founding in 1894 and have about 1,600 employees at our Northbrook headquarters.

UL is driven by our safety mission, which promotes safe living and working environments by the application of safety science and hazard-based safety engineering.

UL recently concluded furniture flammability research, and we'll be showing video excerpts from our testing.

The first video shows a side-by-side comparison of a room filled with legacy furniture you would expect to find in a home in the 1960s and 1970s, and a room with modern day furniture.

During the past 30-plus years, petroleum-based materials such as polyurethane foam and synthetic fabric covers, have supplanted natural materials in furnishings. As you can see, modern furniture typically ignites faster, burns more intensely, releases energy faster, and produces greater amounts of smoke.

As a result, the amount of time available for a safe escape from a home fire is much shorter today than in the past and results in a disproportionately higher number of home fire deaths.

These results are confirmed through related studies by NIST and the National Fire Protection Association (NFPA).

As part of UL's safety mission, in 2008, we began a self-funded research project to determine how fire-retardant-treated foams and fire barriers can affect fire growth. UL focused our research on open-flame testing to complement the smoldering ignition research undertaken by the CPSC and the furniture industry.

Our research consisted of material, mockup, and full-size furniture tests. We tested a variety of materials, including foams treated with and without fire-retardant chemicals, polyester microsuede cover fabric, and various barrier materials. Using a standard flame and ignition source, we measured for heat release rate and mass loss rate.

While we don't have video footage of flame-retardant-treated versus nontreated furniture to show you today, our tests found that, when compared to untreated contemporary furniture, contemporary furniture with flame-retardant foam shows a measurable, but not a meaningful difference in time to flashover or when the gas is emitted from burning materials actually ignite.

Furniture constructed with a flame barrier has flashover times 20 minutes greater than furniture without barriers. This would allow residents significantly more time to safely get out of their homes.

We then expanded the scope of our research to understand how the fire growth of different furniture materials affects survivability for the occupants.

The second video shows a series of fires in identically furnished living rooms. The only differences were the material used in the chair and sofa.

In the four screens, the top left screen contains contemporary or modern furniture. The top right screen contains legacy furniture. The two bottom screens contain contemporary furniture incorporating the fire barrier ignited in different locations.

At 45 seconds, we already see that the flame size in the modern furniture is growing at a faster rate. At the 1-minute mark, the smoke alarm would have sounded. It takes a person about 20 to 40 seconds to react.

At 1 minute 45 seconds, a fire extinguisher probably would not put out the modern furniture fire and the occupant would look to escape.

People take 60 to 90 seconds to gather belongings and children, call 9-1-1, and evacuate.

The modern furniture room in the top left of screen reached flashover at 4 minutes and 45 seconds.

Comparing this with the Chicago Fire Department's goal of being on scene within 3 to 5 minutes after notification, we can deduce that the rooms furnished with modern furniture often reach flashover before the fire services can arrive at the scene.

At 15 minutes, the fire started in the bottom left screen with contemporary furniture incorporating a fire barrier actually self-extinguished. And at 21 minutes and 45 seconds, the barrier-modified furniture in the bottom right screen flashes over.

The living room with legacy furniture finally flashes at 34 minutes and 15 seconds.

Based on the data drawn from earlier tests, we sought to evaluate smoke alarm response and occupant survivability in full-scale homes. We constructed two homes in UL's large-scale fire facility, a one-story, 1,200-square-foot home, and a two-story, 3,200-square-foot home.

We then repeated the previous experiments inside the homes. And though we are still analyzing the results, the preliminary data supports our original findings.

Based on the research we conducted, UL believes, first, modern furniture, whether treated or untreated with flame-retardant chemicals, does not provide sufficient egress time.

Second, for furniture with a flame barrier, the time to flashover is increased to greater than 20 minutes, allowing significantly more time for safe evacuation and fire service response.

PREPARED STATEMENT

With the convergence of flammability and human health impact concerns, UL is beginning to research the nexus of the two.

UL appreciates the opportunity to share our findings, and we look forward to working with you and other stakeholders moving forward.

Thank you.

Senator DURBIN. Thank you.

[The statement follows:]

PREPARED STATEMENT OF AUGUST "GUS" SCHAEFER, SR.

Thank you Chairman Durbin, Ranking Member Moran, and distinguished members of the subcommittee for the opportunity to share Underwriters Laboratories, Inc.'s (UL) research and expertise on the subject of furniture flammability. My name is August "Gus" Schaefer—Senior Vice President and Public Safety Officer at UL.

UL is an independent, not-for-profit standards developer and product testing and certification organization dedicated to public safety. Since our founding in 1894, UL's engineers and staff have helped develop safety standards and product-testing protocols, conducted independent product safety testing and certification, and inspected manufacturing facilities around the world. UL is driven by our global safety mission, which promotes safe living and working environments by the application of safety science and hazard-based safety engineering. The application of these principles manifests itself in the evaluation of tens of thousands of products, components, materials, and systems for compliance to specific requirements. Through these activities, UL actively engages the U.S. Government in its development and administration of Federal regulations and conformity assessment programs at the Federal, State, and local levels. UL works with all participants as a neutral party to ensure the safest possible outcome for those who work with and rely on the products at issue.

FIRE RISK ASSOCIATED WITH UPHOLSTERED FURNITURE

According to the National Fire Protection Association (NFPA), more home fire deaths resulted from fires beginning with upholstered furniture and mattresses/bedding than any other cause. During the 5-year period of 2005–2009, these fires accounted for 19 percent and 14 percent of the deaths and 7 percent and 10 percent of the injuries, respectively. They also accounted for \$824 million in direct property damage.¹

During the past 30+ years, residential interiors have changed dramatically. Homes have increased in size, the number and amount of furnishings and possessions have grown, and petroleum-based synthetic materials have supplanted natural materials in furnishings and home construction products. The combination of these factors has changed the smoke and gas characteristics of residential fires and in some cases, accelerated the speed of fire growth.

For a variety of reasons, manufacturers of home furnishings are turning away from materials like wood and natural fibers in favor of high-performance, lower-cost synthetic materials. For example, most upholstered furniture available today utilizes polyurethane foam for padding and synthetic fabric covers, replacing natural padding materials like cotton, down and feathers, and cover materials made of cotton, wool, linen or silk. While these material changes can lead to products that are easier to clean and more resistant to normal wear and tear, they also react differently when exposed to an ignition source. Studies by UL researchers have found that synthetic materials typically ignite faster, burn more intensely, and release their fire-enabled energy faster creating greater amounts of smoke than natural materials posing a more ominous threat to occupants and their homes.²

The video that will be playing first will show a side-by-side comparison of a room filled with legacy furniture, or furniture you would expect to find in a home in the 1960s and 1970s, and a room with modern furniture purchased at a national department store chain. Both rooms were ignited by placing a lit stick candle on the right side of the sofa and the fires were allowed to grow until flashover. As you will see, the room with modern furniture achieves flashover conditions in a significantly shorter time.

The seemingly insignificant change from natural to synthetic materials in home furnishings has led to residential fires that grow faster and lead to the more rapid onset of untenable conditions. As a result, the amount of time available for safe egress from a home fire is much shorter than in the past. These results corroborate the National Institute of Standards and Technology's (NIST) findings for shorter available safe escape times in residential smoke alarm studies conducted in 2003³ versus 1975⁴ which they attributed in part to faster fire growth.

¹NFPA "Home Structure Fires", August 2011; <http://www.nfpa.org/assets/files/pdf/os.homes.pdf>

²Fabian, T.Z. and Gandhi, P.D., "Smoke Characterization Project: Technical Report", UL, April 2007 (*Available at* [http://www.nfpa.org/assets/files/PDF/Research/Smoke Characterization.pdf](http://www.nfpa.org/assets/files/PDF/Research/Smoke%20Characterization.pdf).)

³Indiana Dunes II: Bukowski, RW. et al, "Performance of Home Smoke Alarms—Analysis of the Response of Several Available Technologies in Residential Fire Settings", NIST, January 2008

⁴Indiana Dunes I: Bukowski, RW. et al, "Large-Scale Laboratory Tests of Smoke Detectors", NIST, 1975.

UNDERWRITERS LABORATORIES RESEARCH EXPLORING THE FIRE SAFETY OF
UPHOLSTERED FURNITURE

As part of UL's safety mission, in 2008 we set out to conduct a self-funded research project to determine if commercially available products such as fire-retardant foams and fire barriers (interliners) can retard and/or reduce the fire growth rate of upholstered furniture exposed to small open flames. Polyurethane foams are highly cellular materials that provide flexibility and comfort. Unfortunately, the physical design and chemistry (polyurethane chemical structure) is highly vulnerable to ignition, flaming liquefaction, and further burning. Flame retardants (most notably bromine and phosphorous) are used to quench the progressing fire growth. Because of the cellular foam structure, the quantities of flame retardants necessary to accomplish this task are extremely high, some as high as upward of 30 percent by weight. Fire barriers are complex woven structures that have both polymeric fibers and inorganic coatings that develop a protective char on burning. When they are exposed to high-temperature flames, the organic polymers burn with the inorganic compounds and form combustion products that are brittle and have mechanical strength (rather than powdery ash). The creation of an inorganic "crust" is a way of slowing down or even preventing the high-temperature flames from impinging on the polyurethane foam. There are many other examples of intumescent or char-forming materials, such as intumescent coatings for steel beams, and polymeric jacketing materials used in plenum cable.

UL decided to focus our research on open-flame testing as we believed that the Consumer Product Safety Commission (CPSC) and the Upholstered Furniture Action Council (UFAC) were already addressing smoldering ignition. The scope of the project later expanded to fully understand the impact upholstered furniture materials play in fire growth and subsequent occupant tenability and survivability. Thus, apart from the ignition of upholstered furniture, our research sought to understand the dynamics of fires that include various constructions of upholstered furniture.

Our research can be divided into three phases. Phase 1 of our research consisted of material-level tests, furniture mock-up tests, and full-size furniture tests, the original scope of the study. Phase 2 compared various upholstered furniture configurations in a living room environment. Finally, Phase 3 included a series of full-scale house fire experiments to determine smoke alarm response and occupant tenability and survivability related to upholstered furniture fires.

PHASE 1: MATERIAL, MOCKUP, AND FULL-SIZED FURNITURE TESTING

Materials utilized in this investigation included 11 commercially available barrier materials constituting different chemistries and physical structures (including flat weaves, knits, and high lofts). Two comparable density polyurethane foam materials were also used: a nonfire retardant foam commonly used in upholstered furniture and a California Technical Bulletin (CA TB) 117 compliant fire-retardant treated foam. UL also utilized the most popular cover fabric from the largest upholstered furniture cover fabric supplier in the United States (CPSC 16 CFR part 1634 Type I compliant beige polyester microsuede).

Tests were conducted on three scales of combustibility:

- material-level tests;
- furniture mock-up tests; and
- full-size furniture tests.

The combustibility behavior of the individual sample materials and combinations of materials (i.e., foam/barrier liner/cover fabric) under well-ventilated, early stage flaming fire conditions was characterized using a cone calorimeter (ASTM E 1354). In the furniture mock-up tests, cushions of the foam and barrier liner combinations evaluated in the material-level test phase were arranged to replicate an interior corner formed by the seat, back, and arm of a chair or sofa. The furniture mock-ups were ignited at the interior intersection of the three cushions using a BS 5852 Flaming Ignition Source 1 (match-flame equivalent). For the full-size furniture test, three of the foam and liner barrier combinations were compared to typical residential materials. Furniture pieces were ignited at the seat-back-arm interior corner, center of the seat-back cushions, and at the back leg area using the same BS 5852 Flaming Ignition Source 1 (match-flame equivalent) as for the furniture mock-ups. Heat release rate and mass loss rate were measured in both instances.

The results of Phase 1 indicated that contemporary furniture constructed with CA TB 117-compliant fire-retardant-treated foam show measurable difference in the time to flashover, but not a meaningful difference compared to contemporary furniture constructed with a nonfire-retardant foam commonly used in upholstered furniture. In addition, when a flame-suppressant technology such as a flame barrier is used between the decorative fabric and the foam, then this furniture (manufac-

tured to UL specifications with polyurethane foam) behaves closer to “legacy” furniture. Specifically the time to flashover is increased to greater than 20 minutes—which would allow residents significantly more time to safely get out of their homes.

The results of these experiments provide knowledge on the potential fire-growth reduction for the different investigated strategies, implementation feasibility, the interaction between different chemistries and components, and the influence of test scale and sample design on fire performance. Collectively, this information can be used by researchers, manufacturers and industry associations, and regulators such as CPSC and California Bureau of Home Furnishings and Thermal Insulation (CA BEARHFTI) to establish appropriate technical requirements, and a corresponding compliance program, for upholstered furniture akin to the CPSC program for mattresses.

PHASE 2: COMPARISON OF UPHOLSTERED FURNITURE ON LIVING ROOM FLASHOVER

As you will see in the second video, in Phase 2 we conducted a series of fires in a living room environment to better understand the impact upholstered furniture materials have in fire growth. The room environments were identically furnished with an engineered wood television stand, book case, coffee table, and end tables purchased from a national department store chain. In addition, the rooms had other fuel loads such as a 37-inch flat panel display television, plastic toy bins, stuffed toys, and polyester curtains. The only differences in the rooms were the materials used in the upholstered chair and sectional sofa. The top left screen contains contemporary upholstered furniture with polyester wrap covered polyurethane foam cushions, and polyester microsuede cover fabric. The top right screen is furniture constructed in legacy materials such as cotton batting around metal spring cushions and cotton cover fabric. The two bottom screens consist of barrier modified contemporary upholstered furniture with high-loft fire barrier covered polyurethane-foam cushions and polyester microsuede cover fabric. The fires were ignited by placing a lit candle on the right side of the sofa and allowed to grow until flashover. One of the barrier modified sets of furniture was ignited in the center of the sofa where the seat and back cushions for two spots meet.

At 45 seconds we can already see that the flame size on the contemporary furniture is growing at a faster rate than the other furniture pieces. At the 1-minute mark, the smoke alarm would have activated to notify the occupants. We can assume it would take an occupant at the earliest about 20–40 seconds to recognize the danger and to take appropriate actions, such as finding a fire extinguisher. At 1 minute and 45 seconds, the fire in the contemporary furniture environment would be difficult to handle with a fire extinguisher and the occupant would then look to escape. On average, people take 60–90 seconds to dress, call 911, gather personal belongings, and awaken two children. Once a call is placed to 911, a dispatcher will alert the local fire department to head to the scene. The Chicago Fire Department is the Nation’s second-largest fire department and their goal is to be on-scene within 3–5 minutes after dispatch. Other departments may take longer such as those servicing rural areas. Additionally, this is just the time for the fire service to arrive; once at the scene, they still have to assess the scene.

The room furnished with contemporary upholstered furniture in the top left of screen transitioned to flashover at 4 minutes and 45 seconds. At 15 minutes the fire started at the interior corner of the barrier-clad contemporary furniture has self-extinguished. Flashover occurs for the barrier clad contemporary furniture ignited between the seats at 21 minutes and 45 seconds which is 17 minutes later than the identical furniture that does not have the fire barrier. At 34 minutes and 15 seconds, the living room furnished with legacy furniture flashes over, consistent with what we found for the used furniture in the modern vs. legacy side-by-side video. From this video, we can deduce that rooms furnished with contemporary furniture often reach flashover point prior to the fire service arriving at the scene of the fire.

PHASE 3: COMPARISON OF UPHOLSTERED FURNITURE ON OCCUPANT TENABILITY AND SURVIVABILITY

Based on the data drawn from Phase 2 and exemplified in the second video that you just witnessed, UL wanted to determine what the smoke alarm response and occupant tenability and survivability in an actual full-scale home. In March 2012 a series of full-scale house fire experiments was conducted in UL’s large fire facility. One house was a one-story, 1,200 square-foot, 3 bedroom, 1 bathroom house (8 rooms total); the second house was a two-story, 3,200 square-foot, 4-bedroom, 2.5-bathroom house (12 rooms total). The second house featured a contemporary open floor plan with the two-story great room and foyer open to the upstairs bedrooms.

The living/great rooms were identically furnished with engineered wood television stand, coffee table, a lamp, and end tables purchased from a national department store chain. The only furnishings that differed in the tests were the materials used in the upholstered chair and sectional sofa. The contemporary furniture was constructed using the same hardwood frames, but one set consisted of polyester wrap covered polyurethane foam cushions, polyester microsuede cover fabric while the other introduced a high-loft fire barrier to cover the polyurethane foam cushions. The fires were ignited by placing a lit candle on the right side of the sofa and allowed to grow until temperatures in a remote location from the fire reached an unsurvivable level of 150 °C (302 °F). Preliminary data analysis supports Phase 2 findings but we are still currently analyzing the results of these recent experiments.

CONCLUSIONS

Based on the research we conducted, UL believes:

One, that the typical flame-retardant chemical concentrations used to meet fire regulations in upholstered furniture do not provide for sufficient fire egress times. The most common of those fire regulations is the BEARHFTT's CA TB 117 performance requirements.

Two, that when a flame-suppressant technology, such as a flame barrier, is used between the decorative fabric and the foam, then this furniture (manufactured to UL specifications with polyurethane foam) behaves closer to "legacy" furniture. Specifically, the time to flash over is increased to greater than 20 minutes—which would allow occupants significantly more time to safely evacuate their home and allow for fire service to respond to the fire.

Three, that barrier materials need not be made of a chemical flame retardant that may or may not pose a negative impact on human health or the environment. It is conceivable that manufacturers could incorporate various innovative barrier methods in upholstered furniture with minimal impact on current manufacturing methods. Some types of barriers such as high-loft barriers could be used as a replacement for polyester wrap thereby minimizing impact on manufacturing and labor. Other barriers, such as flat barriers similar to those incorporated by the mattress industry, could pose an additional manufacturing step, but do yield increased fire-safety performance.

In addition to fire research UL has conducted on upholstered furniture, UL has also conducted studies in cooperation with the Fire Protection Research Foundation (a foundation under NFPA) on smoke characterization to understand smoke associated with materials commonly found in residential homes today and to provide data points to develop better smoke-sensing technology or smoke-suppression technology in end products. UL also has the ability to measure consumer exposure and indoor air quality to flame retardant and alternative chemicals under normal-use conditions and during combustion or fire processes for the measurement of toxic byproducts using environmental chamber technology. This technology allows the study and impact of alternative construction techniques like the use of fire barriers, reduction of synthetic materials, petrochemical-based construction materials; and the use of alternative, less-toxic flame retardants for bedding, furniture, construction materials, and electronics. This allows for system and component analysis under normal and abnormal conditions to help facilitate the development and validation of chemically safe, fire-resistant products.

UL appreciates this subcommittee's interest in furniture flammability-related matters and how all parties can work to enhance public safety. We appreciate the opportunity to share our knowledge and look forward to working with you and other stakeholders moving forward.

Senator DURBIN. Mr. Counts.

STATEMENT OF ANDY S. COUNTS, CEO, AMERICAN HOME FURNISHINGS ALLIANCE

Mr. COUNTS. Good afternoon. I'm Andy Counts, chief executive officer at American Home Furnishings Alliance. I want to thank you, Chairman Durbin and staff, for allowing me to participate in today's hearing.

The issue of upholstered furniture flammability has been a topic of discussion and debate at CPSC since it inherited the Flammable Fabrics Act in 1973.

Since this time, CPSC has considered several petitions on the issue and released multiple draft standards to address the flammability of upholstered furniture.

As these proposals progressed, CPSC's objective has moved from the risk of small open-flame ignition to the combined risk of small open flame and smolder ignition, and finally to the risk of smolder ignition only.

Consistently, over time, CPSC's statistics have shown that 90 percent of upholstered furniture fires result from smolder ignition.

California Technical Bulletin 117, or TB-117, is required for all upholstered furniture sold in the State of California and attempts to address both smolder and small open-flame ignition.

Unlike smolder ignition, small, open-flame resistance generally requires the treatment of fabric and cushioning materials with flame-retardant chemicals.

During the time that CPSC has been considering furniture flammability, evidence about the potential eco-toxicity and bioaccumulation of certain flame retardants have reshaped the thinking regarding fire and chemical risks. Restrictions on flame-retardant use and production are depleting the compliance toolbox of compounds equipped to achieve open-flame resistance in furniture and to meet TB-117.

In addition, CPSC staff has found that reformulated foam cushions used to comply with TB-117 do not meaningfully improve small open-flame performance.

TB-117 is the only reason flame-retardant chemicals are found in upholstered furniture. California Governor Jerry Brown recently issued a statement directing the State's Bureau of Electronic Appliance Repair, Home Furnishings and Thermal Insulation to revise TB-117 to end the reliance on flame-retardant chemicals.

As a result of this directive, a draft revised California standard has recently been released that will focus solely on smolder ignition.

According to a recent NFPA report, the long-term trend in smoking material fires has been down by 73 percent from 1980 to 2010.

More importantly, the trend line for upholstered furniture as the first item ignited by smoking materials is also declining. In 1980, NFPA estimated that there were 21,500 fires caused by smolder ignition of upholstered furniture. And by 2010, that number had been reduced to 1,500.

Likewise, civilian deaths due to smolder ignition in upholstered furniture have decreased from 1,030 in 1980 to 210 in 2010. When you factor in population growth over this period, you can begin to fathom the significance of these decreases.

This downward trend in fire statistics involving smoking materials and residential upholstery is to some degree the result of a successful industry fire standard. The voluntary program was developed by the Upholstered Furniture Action Council (UFAC) in 1977.

Unlike TB-117, the UFAC program does not require the use of any flame-retardant chemicals. UFAC construction criteria have been adopted by both the American Society for Testing and Materials as ASTM 1353, and NFPA. It is estimated that 90 percent of domestic furniture shipments comply with the UFAC standard.

We understand the frustration some have expressed about the pace of progress on this issue. However, we shouldn't disregard the technical challenges associated with achieving improved fire resistance for a product that is typically covered in fabric and filled with plastics, cellulose, and other cushioning materials.

Add to this the differential performance of the tens of thousands of upholstery fabrics on the market, and you begin to understand the challenge CPSC shouldered.

An approach that addresses only smolder ignition is not perfect, but represents what is achievable at this point, given these sometimes competing factors.

We recommend that the CPSC immediately move to adopt ASTM 1353 to address the primary smolder ignition risk from upholstered furniture. That would provide CPSC with the time it needs to further investigate the feasibility of its barrier for smolder-prone fabrics and submit its draft testing methods to the necessary round robin laboratory analysis to ensure good repeatability and reproducibility. This round robin analysis is essential to the development of an enforceable standard.

PREPARED STATEMENT

We look forward to our continued work with the CPSC on this important issue and to assisting our members with compliance.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF ANDY S. COUNTS

The American Home Furnishings Alliance (AHFA) represents manufacturers and importers of residential furnishings that include upholstered furniture, wood furniture, home office, and decorative accessories. AHFA companies participate in a highly competitive global market characterized by ever-changing style preferences, margin pressures, and the tendency of consumers to postpone big-ticket purchases if their perceptions of value and function are not satisfied.

AHFA respectfully submits these comments regarding the effectiveness of upholstered furniture flammability standards and flame-retardant chemicals.

BACKGROUND INFORMATION

There is currently one mandatory flammability standard for residential upholstered furniture in the United States. That standard, California Technical Bulletin 117 (TB-117), is required for all upholstered furniture sold in the State of California.

Before we begin our discussion on the effectiveness of upholstered furniture flammability standards, we want to share with you several hard-learned facts based on 40+ years of experience with this topic. First, fire testing is not a precise science. Today's modern fire-testing methodology suffers from three important weaknesses. First, none of the present test methods have been reconciled with what actually happens in real-world fire scenarios, either qualitatively or quantitatively. Second, the precision of today's fire tests is reprehensibly poor with testing errors commonly exceeding 50 to 100 percent. Finally, computer models are only as good as the data driving them. As noted above, the precision and bias of the data is deficient so standard fire tests often lack the repeatability that agencies expect with mandatory standards. This makes a flammability standard extremely difficult to enforce.

Definition of the objective is 50 percent of the solution. There is no such thing as fire-proof furniture and it simply is not a realistic or practical goal. The U.S. Consumer Product Safety Commission (CPSC) did not conceive this at the beginning and therefore the objective of its rulemaking was not clearly defined. Initially it appeared that CPSC wanted to prevent any ignition of the cover fabrics. This proved to be unattainable because everything will burn and each fire is unique. Later, the agency moved away from "no ignition" toward "slowing" the progression of the fires

and thereby allow more egress time. The later is an achievable goal and one which we continue to believe can be met.

Third, there are no quick fixes or silver bullets when it comes to upholstered furniture flammability. There are a myriad number of configurations, fabrics, and fillings that are utilized by our industry to satisfy the consumer's needs and tastes. And the issue is counterintuitive. The materials that are most resistant to smolder ignition tend to be poor performers when it comes to resisting open-flame ignition and vice versa. These three facts have compounded the difficulties CPSC has encountered in this complex rulemaking.

THE NATIONAL DISCUSSION

The issue of upholstered furniture flammability has been a topic of discussion and debate at CPSC since it inherited the Flammable Fabrics Act from the Department of Commerce and the Federal Trade Commission in 1973. Since this time CPSC has considered several petitions on the issue and released multiple draft standards to address the flammability of upholstered furniture in 1997, 2001, 2004, and 2005. A proposed rule was finally promulgated in 2008. As these proposals progressed, CPSC's objective has moved from the risk of small open-flame ignition to the risks of small open-flame ignition and smolder ignition, and finally to the risk of smolder ignition only.

We welcomed the 2008 proposal because it was the first to focus solely on the risk of smolder ignition which is the predominant flammability hazard associated with upholstered furniture. Consistently over time, CPSC statistics show that 90 percent of upholstered furniture fires result from smolder ignition. Each year, there are approximately five times as many incidents of smolder ignitions as there are small open flame-related incidents.¹

According to a recent National Fire Protection Association (NFPA) report,² "the long-term trend in smoking-material fires has been down, by 73 percent from 1980 to 2010." More importantly for this discussion, the trend line for upholstered furniture as the first item ignited by smoking materials is also declining. In 1980, NFPA estimated that there were 21,500 fires caused by smolder ignition of upholstered furniture and by 2010 that number had been reduced to 1,500.³ Likewise, civilian deaths due to smolder ignition of upholstered furniture have decreased from 1,030 in 1980 to 210 in 2010.⁴ Finally, civilian injuries have declined from 1,910 in 1980 to 260 in 2010.⁵

THE UPHOLSTERED FURNITURE ACTION COUNCIL

The downward trend in fire statistics involving smoking materials and residential upholstery is, to some degree, the result of a successful industry fire standard. This voluntary program was developed by the Upholstered Furniture Action Council (UFAC) in 1977. It has demonstrated that fabric and yarn changes along with the use of substrates between fabric and foam yield improved smolder performance. Unlike TB-117, the UFAC program does not require the use of any flame-retardant chemicals. Also unlike TB-117, UFAC program has undergone round-robin testing and has shown to be repeatable and reproducible. Because of this, UFAC construction criteria were adopted by both the American Society for Testing and Materials (ASTM E 1353) and the NFPA (NFPA 260).

Perhaps the greatest contribution of the UFAC program has been to remove smolder-prone materials from the market and replace them with safer ones. Padding materials such as untreated cotton batting, sisal pads, loose sisal, jute pads, rubberized horsehair, and kapok could not pass any of the UFAC criteria and consequently disappeared from the marketplace.

Likewise, UFAC has contributed to the development of safer materials. In addition to inventing heat-conducting welt cords, it effectively set the standards for polyurethane foam and class I fabrics. Seating-grade and padding-grade flexible polyurethane foams must pass the UFAC filling and padding test method. As a result, noncompliant foam is gone from the market. With respect to fabric covers, the UFAC test methods accelerated the use of thermoplastic fibers. This expanded the number of class I fabrics, the type most resistant to smolder ignition, and reduced the number of class II fabrics which require the use of a smolder-resistant barrier material. While it is estimated that 90 percent of domestic furniture shipments com-

¹ U.S. CPSC, Regulatory Options Briefing Package, October 28, 1997, p. 153.

² John R. Hall Jr., *The Smoking-Material Fire Problem*, March 2012, p. i.

³ *Id.* at 21.

⁴ *Id.* at 22.

⁵ *Id.* at 23.

ply with the UFAC standard, the net result has been to afford low-income consumers the benefit of the UFAC program even if their manufacturers are not participating in UFAC. That is because these safer materials are the only ones that can be found in the marketplace.

In the course of the current CPSC rulemaking, UFAC reviewed TB-117 promising CPSC to incorporate the best aspects of TB-117 as part of UFAC's construction criteria. However, when testing was completed, UFAC concluded that TB-117 foam was not more effective than the conventional foam required by UFAC. Therefore, it declined to modify its construction criteria. CPSC later tested TB-117 foam and confirmed that it demonstrated no significant added protection in small open-flame scenarios compared to UFAC complying upholstered furniture products.

SMALL OPEN-FLAME RESEARCH

The current emphasis on smolder ignition is a sensible response to the technical difficulties associated with the small open-flame approaches considered during the course of the rulemaking. Early in the project, CPSC staff found that reformulated foam cushions used to comply with TB-117 did not meaningfully improve small open-flame performance. Subsequent testing of so-called "TB-117 plus" foam revealed it performed worse than conventional foam and was inferior in some smoldering scenarios.

A 2001 proposal allowed the use of flame-blocking barriers as protection against open-flame ignition. However, CPSC staff found that barrier materials perform inconsistently depending on the cover fabrics and ignition source. Some barriers were effective in conjunction with a number of outer fabrics, but not with others. Those failing fabrics were more appropriate candidates for a flame-retardant chemical treatment option.⁶

Currently available barrier technology utilized to meet California's standard for public occupancy furniture (TB-133) and to meet the Federal mattress standard (16 CFR 1633) is not well-suited for application to residential upholstered furniture. In addition to the complexities created by the various geometries and spatial relationships of furniture, existing barriers would negatively impact the hand, drape, and seat of residential upholstered furniture. These barriers also lack important performance characteristics such as loft, resiliency and neutral color, which are critical for the residential upholstered furniture market.

RESEARCH AND REGULATION OF FLAME RETARDANTS

TB-117 is the only reason flame-retardant chemicals are found in upholstered furniture. The focus on smolder ignition minimizes the reliance on flame-retardant chemical treatments. Unlike smolder ignition, small open-flame resistance generally requires the treatment of fabrics and cushioning materials with halogenated compounds (i.e., bromine or chlorine). The widespread application of these chemicals to produce upholstered furniture components would certainly have resulted from the prescribed test methods proposed in the 1997, 2001, 2004, and 2005 CPSC briefing packages.

During the time that CPSC has been considering furniture flammability, evidence about the potential ecotoxicity and bioaccumulation of halogen flame-retardants have reshaped the thinking regarding fire and chemical risks. Restrictions on flame-retardant use and production are depleting the compliance toolbox of compounds equipped to achieve open-flame resistance in furniture and to meet TB-117.

In 2004, AHFA (then the American Furniture Manufacturers Association or AFMA) co-chaired and participated with other key industry stakeholders in a project sponsored by Environmental Protection Agency's (EPA) Design for the Environment' (DfE). The scope of this project was to develop an assessment tool to evaluate emerging flame-retardant chemistry that could potentially be used to replace existing chemical solutions used to meet existing flammability standards. The focus was to develop a science-based matrix to evaluate and screen the potential risk of emerging flame-retardant chemicals to human health and the environment. The resulting matrix did not provide the absolute certainty needed to determine if the flame-retardant chemistry was safe and effective.

In January 2010, EPA added polybrominated diphenyl ethers (PBDEs)—used as flame retardants in a wide range of products, including fabrics and foam—to its "chemicals of concern" list, meaning it considers them substances that "may present an unreasonable risk of injury to health and the environment." The furniture industry had already voluntarily phased out the use of these chemicals in 2005. The only

⁶U.S. CPSC Upholstered Furniture Flammability: Analysis of Comments from the CPSC Staff's June 2002 Public Meeting, p. 30.

PBDE still on the market in North America, is decaBDE, a fabric flame-retardant effective across a full spectrum of fiber types. Critics of decaBDE often cite evidence that it can degrade (debrominate) into more hazardous congeners that are already the subject of regulatory action.

DecaBDE has been banned or substantially restricted in Washington State, Maine, and the European Union. Asian countries and other U.S. States are considering similar legislation. Without decaBDE, fabric mills indicate that achieving open-flame resistance would require the commercialization and testing of more specialized chemical formulations geared to particular fabric types. Environmental authorities and policy makers now appear to be moving toward restrictions on bromine and chlorine flame-retardant chemicals generally.

Last year in California, the Office of Environmental Health Hazard Assessment (OEHHA) added TDCPP (Tris (1,3-dichloro-2-propyl) phosphate), a flame-retardant chemical commonly used in furniture applications, to its list of chemicals subject to Proposition 65. Governor Brown recently issued a statement directing the State's Bureau of Home Furnishings and Thermal Insulation (BEARHFTI) to revise TB-117 to end the reliance on flame-retardant chemicals. In the present Federal rule-making, environmental advocates have urged CPSC to forego regulatory approaches that would encourage such chemical use.

As a result of the Governor Brown directive a draft revised California standard (TB-117 2012) has recently been released that will focus solely on smolder ignition and take a similar approach to the 2008 proposed CPSC standard.

OTHER TRENDS SHAPING FIRE STATISTICS

Any current discussion of this issue should be made in the context of fire statistics that have improved significantly in response to a number of trends. In addition to the impact of voluntary industry standards such as UFAC, Americans are smoking less and are increasingly protected by working smoke and carbon monoxide detectors. Small open-flame statistics are being driven downward by the use of child-resistant lighters pursuant to CPSC regulations finalized in 1993 and a CPSC-sponsored voluntary performance standard for candles. In addition, all States have enacted requirements for reduced ignition propensity (RIP) cigarettes. The March 2012 NFPA study on smoking material fires estimates that RIP cigarettes alone will reduce fire deaths 30 percent from 2003, the last year before any State-implemented this legislation.⁷ All of these developments can be expected to further reduce residential fires associated with upholstered furniture.

CONCLUSION AND RECOMMENDATIONS

We understand the frustration some have expressed about the pace of progress on this issue. However, we shouldn't disregard the technical challenges associated with achieving improved fire resistance for a product that is typically covered in fabric and filled with plastics, cellulose, and other cushioning materials. Add to this the differential performance of the tens of thousands of upholstery fabrics on the market; the synergy between fabrics and filling materials; and you begin to understand the challenge CPSC has shouldered.

Upholstered furniture flammability encompasses not only fire science, but consumer preferences, behavioral factors, the competitiveness of domestic industries and the increasing scrutiny of chemicals that may pose a risk to human health and the environment.

Our industry is committed to supporting government and private sector solutions based on three criteria:

- safe;
- effective; and
- saleable.

To be "safe", a solution must not introduce new risks to consumers, workers, or the environment and not undermine the existing level of resistance to smolder ignition. To be "effective", a solution must reduce the number of residential fires involving upholstered furniture and must not create a false sense of security to the consumer. To be "saleable", a solution must result in furniture that is attractive, comfortable, durable, and affordable. A solution that meets the criteria of safe, effective, and saleable continues to form the basis for an industry supported Federal standard for residential upholstered furniture.

An approach that addresses only smolder ignition is not perfect, but represents what is achievable at this point given these sometimes competing factors. We recommend that the CPSC immediately move to adopt ASTM 1353 to address the pri-

⁷ Hall, *supra* at 11.

mary smolder-ignition risk from upholstered furniture. That will provide CPSC with the time it needs to further investigate the feasibility of its barrier for smolder-prone fabrics and to submit its draft test methods to the necessary round-robin laboratory analysis to ensure good repeatability and reproducibility. This round-robin analysis is essential to the development of an enforceable standard.

After finalization of a standard that addresses smolder ignition, CPSC resources can then be concentrated on determining if potential solutions to small open-flame risk exist and are justified. This effort must provide multiple options for compliance and a mechanism for identifying safe and effective flame-retardant chemistry.

Any mandatory flammability standard must also rely on the use of compliant components and not the use of composite testing. Furniture manufacturers are assemblers of components provided by third-party suppliers. The combination of these various components results in thousands of SKUs. This volume makes the testing of full-scale or mockup composites not only unreasonable, but impossible.

Finally, cost must be a consideration. The statistics of residential fires have told us repeatedly over the years that the residential fire problem in the United States primarily lies in households with lower incomes, less education, and a higher proportion of single parents. This segment of the population is the most sensitive to cost increases, yet this segment is clearly the most in need of the protection that safer upholstery will provide. Furniture that meets ASTM 1353 is proven to provide an acceptable level of fire protection at price points that will primarily benefit them and the firefighters charged with saving their lives.

We look forward to working with CPSC on this important issue and to assist our members with the compliance obligations they will face once a new rule is finalized.

Senator DURBIN. Thanks, Mr. Counts.
Peter Van Dorpe.

STATEMENT OF PETER VAN DORPE, CHIEF, TRAINING DIVISION, CHICAGO FIRE DEPARTMENT

Mr. VAN DORPE. Good afternoon. Thank you for having me here today. My name is Peter Van Dorpe. I've been a firefighter for 32 years. I'm a district chief in the Chicago Fire Department and in charge of the Training Division.

Since 2006, I have been one of the Chicago Fire Department's liaisons to and have served as a subject-matter expert for various agencies and universities that have been conducting fire-safety research. These agencies include UL, NIST, University of Illinois, Michigan State University, and New York Polytechnic, among others.

This research has been funded largely through the Department of Homeland Security's Assistance to Firefighters Grants Program.

Through both my experience on the fire ground and in the course of my participation in these research projects, I've become acutely aware of the significant changes that have occurred over the last 40 to 50 years in the way homes are built and the way that we furnish them. What you have seen here today, as dramatic as it is, demonstrates only a fraction of the changes that have taken place.

Put as simply as possible, we are making homes bigger. We're building them with less massive structural components and then we're filling them with more air and more fuel than ever before.

From a firefighter's perspective, this is a recipe for disaster for both the fire service and the public we have sworn to protect.

Part of the reason why I was selected to speak at this hearing is because I was already scheduled to be in Baltimore tomorrow to deliver a workshop at Firehouse Expo. Firehouse Expo is one of several conferences that I and my colleagues from the Chicago and New York City Fire Departments, UL, NIST, and other research partners attend each year to deliver the findings of its research to the American fire service.

We call it bringing science to the street, and our goal is to make sure that the firefighters that arrive at your door in your time of need come with a set of strategies, tactics, skills, and knowledge to best equip them to safely and effectively combat the fire they will face.

The first and most important part of reaching that goal is to make sure these firefighters understand the scope and magnitude of the changes in the modern fire environment. I hope to convey some sense of that change to you in this brief time we have today.

I will keep it simple: It's stuff, and there's more stuff, and that stuff is made out of plastic. And more stuff, more of that plastic stuff, is made out of plastic that contains its own air supply—extruded polyurethane foam in furniture.

All of this stuff is fuel, and we're packing more and more of it into our boxes that we live in every day.

How this stuff in these boxes behave, interact, and maintain their integrity under fire conditions goes largely unregulated, so long as that box is labeled one- or two-family occupancy and the stuff is intended to be used by the people that occupy those houses.

It should come as no surprise to us that most fire deaths occur in one- and two-family homes.

The statistics that support these statements are readily available and accessible from NFPA, UL, NIST, the National Institute of Occupational Safety and Health, and a host of other universities and Government agencies.

Please allow me to share with you some lesser-known statistics. In 1903, 605 people died in the Iroquois Theater fire in Chicago. In 1911, 146 died in the Triangle Shirt Waist fire in New York City. There were 294 deaths in the Consolidated School fire of 1937, 492 in the Coconut Grove Supper Club fire of 1942, and 100 in the Station Night Club fire of 2003.

Indeed, the 10 largest single-building fatal fires over the last century have totaled more than 2,800 deaths. And that number does not include the 2,666 deaths that occurred in the fires that were in the aftermath of the September 11 attacks.

Each of these tragedies, as well as many like them throughout our history, brought about a response that was proportionate to the scope and magnitude of the event. Perhaps the most important part of the response to each of these events and those like them were the significant changes made in the way we design, build, inspect, and otherwise regulate the buildings we occupy and the things that we put in them.

We can and should be proud of the way we respond as a society to the disasters and tragedies that befall our communities. However, the tragedy that is the yearly fire death toll in the United States goes unaddressed largely because it goes unrecognized.

Each and every year, between 2,500 and 3,000 people die in fires in the United States. That's more than died in the September 11 attacks and more than died in the 10 most tragic fires in our history. And it happens year after year after year.

Eighty-five percent of those fire deaths occur in homes, and they most often occur in ones and twos. Hence, those of you who aren't professionally attuned to the situation are not familiar with the scope and magnitude of the problem.

I hope my testimony today will help bring it to the forefront for a time.

Statistically, three people died in fires while you slept last night, and another will die while we are here discussing the merits of the issues before us. Three more will die in the time you will make your way home tonight and end your day and return to sleep. Tomorrow and every day will be just like today unless and until we do something different about the way we build, protect, and furnish homes in this country.

When I'm teaching building construction to firefighters, I make it a point to focus on the hazards of lightweight construction and practices used in single-family homes. And I always begin and end by telling them, "It ain't about the gusset plates."

Gusset plates are a fastening method that has replaced traditional nails in lightweight wood truss construction. The fire service frequently points to them as the cause of early collapse of floor and roof systems in buildings using these systems.

What I mean to convey to them with this phrase is that we need to focus less on the components and more on the totality of the changes to the built environment and the fuel loads we are placing in them.

Similarly, I encourage you not to get lost in the weeds of which methods of reducing residential fire losses and fire deaths are the most efficient, effective, or environmentally friendly. For example, while the effects of adding fire-retardant chemicals to extruded foams and fills has been shown to be of limited value, this does not preclude the use of retardants in any and all circumstances.

Most approaches to reducing fire growth and propagation in furniture and finishes have value, and they should all be investigated and pursued.

The mattress industry has demonstrated that an approach that applies a variety of methodologies is the most likely to sustain success over the long run.

Most tragedies, and certainly those that arise in accidents in the home, are not the result of gross negligence or malice on anyone's part. Rather, they are the sum of what my colleague Vicki Schmidt, a volunteer firefighter and a State instructor in Maine, refers to as the pitter-patter of little defeats, those individually minor errors and omissions that we allow to accumulate and coalesce into tragic events.

Please permit me to outline for you what I believe to be some effective guidance for meeting the challenges before you. Increased residential firefighters' fire safety, and firefighter safety, requires reducing ignition sources.

Today, this is largely an issue related to behaviors including smoking, alcohol use, and the safe use of open flames such as candles. Reducing the development and prorogation of fires that do occur by addressing the flammability and fire development characteristics of home furnishings and finished materials, particularly those that contain extruded polyurethane foam and related materials.

Reducing the impact of fires that do occur upon the occupants through more thorough and effective regulations requiring active and passive fire protection and detection systems in homes. And,

yes, that does mean we need to advocate for residential fire sprinklers in all new construction.

Reducing the impact of fires that do occur upon the structural system of the home, by requiring structural assemblies used two-family homes be protected in the same way that they are required to be protected in other occupancies.

Finally, enabling the American fire service to do our job more safely and effectively by doing all of the above and by continuing to fund the fire-safety research and dissemination of life-saving information it is generating.

In closing, I wish to assure you that the challenge is not as difficult as you may think. Indeed, the problem has already been solved.

Look around you. Look above your heads. This is a fire-safe building. We have applied the lessons of the past and appropriate science and technology to design an occupancy that provides a safe and secure environment for its occupants.

PREPARED STATEMENT

We can do the same for residential occupancies. We have the knowledge and the technology to meet all the challenges, whether they be temporal, behavioral, financial, or environmental. All we need is the will to act.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF PETER VAN DORPE

Good afternoon. My name is Peter Van Dorpe. I have been a firefighter for 32 years. I am a District Chief on the Chicago Fire Department in charge of the Training Division. Since 2006 I have been one of the Chicago Fire Department's liaisons and have served as a subject-matter expert for various agencies and universities that have been conducting fire-safety research. These agencies include Underwriters Laboratories (UL); the National Institute of Standards and Technology (NIST); the University of Illinois; Michigan State University; New York Polytechnic; and others. This research has been funded largely through the Department of Homeland Security's Assistance to Firefighters Grants program. Through both my experience on the fire ground and in the course of my participation in these research projects I have become acutely aware of the significant changes that have occurred over the last 40 to 50 years in both the way homes are built and the way that they are furnished. What you have seen here today, as dramatic as it is, demonstrates only a fraction of the changes that have taken place. Put as simply as possible, we are making homes larger, building them with less massive components, and then filling them with more air and more fuel than ever before. From a firefighter's perspective this is a recipe for disaster for both the fire service and the public we have sworn to serve and protect.

Part of the reason why I was selected to speak at this hearing is because I was already scheduled to be in Baltimore tomorrow to deliver a workshop at Firehouse Expo. Firehouse Expo is one of several conferences that I and my colleagues from the Chicago and New York City fire departments, UL, NIST and the other research partners attend each year to deliver the findings of this research to the American fire service. We call it "bringing science to the streets" and our goal is to make sure that the firefighters that arrive at your door in your time of need come with the set of strategies, tactics, and skills that best equip them to safely and effectively combat the fire they will face. The first and most important part of reaching that goal is to make sure our students understand the scope and magnitude of the changes in the modern fire environment. I hope to convey some sense of that change to you as well in the brief time that I have with you today. I will keep it simple: Stuff. More stuff. More stuff made of plastic (petroleum). More stuff made of plastic with a built in air supply (polyurethane foam, i.e., furniture). All of this stuff is fuel and we are packing more and more of it into the boxes that we live in. How this stuff and these boxes behave, interact and maintain their integrity under fire condi-

tions goes largely unregulated so long as the box is labeled “one or two family occupancy” and the stuff is intended to be used by the people that occupy it. It should come as no surprise to us that most fire deaths occur in one- and two-family (read, “unregulated”) occupancies. The statistics that support these statements are readily available and accessible from the National Fire Protection Association, UL, NIST, the National Institute of Occupational Safety and Health, etc.

In 1903, 605 people died in the Iroquois Theater fire in Chicago. In 1911, 146 died in the Triangle Shirt Waist fire in New York City. There were 294 deaths in the Consolidated School fire of 1937; 492 in the Coconut Grove Supper Club of 1942; and 100 in the Station Night Club fire of 2003. Indeed, the 10 largest single building fatal fires over the last century total more than 2,800 deaths. Of course we are all aware of the 2,666 lives lost at the fires of September 11. Each of these tragedies, as well as many like them throughout our history, brought about a response that was proportionate to the scope and magnitude of the event. Perhaps the most important part of the response to each of these events and those like them were the significant changes made in the way we design, build, inspect, and otherwise regulate the buildings we occupy and the things we put in them. We can and should be proud of the way we respond, as a society, to the disasters and tragedies that befall our communities.

However, the tragedy that is the yearly fire death toll in the United States goes unaddressed, largely because it goes unrecognized.

Each and every year, between 2,500 and 3,000 people die in fires in the United States. That’s more than died in the September 11 attacks and more than died in the 10 most tragic fires in our history, and it happens year, after year, after year. Eighty-five percent of these fire deaths occur in homes and they most often occur in one- and two-family homes. Hence, those of you who aren’t professionally attuned to the situation are not familiar with the scope and magnitude of the problem. I hope my testimony today will help bring it to the forefront for a time. Statistically, three people died in fires while you slept last night. Another will die while we are here discussing the merits of the issues before us. Three more will die by the time you make your way home tonight, end your day and return to sleep. Tomorrow and every day will be just like today; unless and until we do something different about the way we build, protect, and furnish homes in this country.

When I am teaching building construction to firefighters I make it a point to focus on the hazards of lightweight construction practices used in single family homes and I always begin and end by telling them, “it ain’t about the gusset plates”. Gusset plates are a fastening method that has replaced traditional nails in lightweight wood truss construction. The fire service frequently points to them as the cause of early collapse of floor and roof systems in buildings using these systems. What I mean to convey to them with this phrase is that they need focus less on the components and more on the totality of the changes to the built environment and the fuel loads placed in them. Similarly, I encourage you not to get lost in the weeds of which methods of reducing residential fire loss and fire death are the most efficient, effective or environmentally friendly. While the effects of adding fire-retardant chemicals to extruded foams and fills has been shown to be of limited value, this does not preclude the use of retardants in any and all circumstances. Most approaches to reducing fire growth and propagation in furniture and finishes have value and they should all be investigated and pursued. The mattress industry has demonstrated that an approach that applies a variety of methodologies is most likely to sustain its success over the long run.

Most tragedies, and certainly those that arise around accidents in the home, are not the result of gross negligence or malice on anyone’s part. Rather, they are the sum of what my colleague Vicki Schmidt, a volunteer firefighter and State fire instructor in Maine refers to as the “pitter-patter of little defeats”; those individually minor errors and omissions that we allow to accumulate and coalesce into a tragic event.

Please permit me to outline for you what I believe to be some effective guidance for meeting the challenge before you. Increased residential fire safety requires:

- Reducing Ignition Sources.*—Today this is largely an issue related to behaviors including smoking, alcohol use, and open flames such as candles, etc.
- Reducing the development and propagation of fires that do occur by addressing the flammability and fire development characteristics of home furnishings and finish materials, particularly those that use or contain extruded polyurethane foam and related materials.
- Reducing the impact of fires that do occur upon the occupants through more thorough and effective regulations requiring active (i.e., residential sprinkler systems) and passive fire protection and detection systems in homes.

—Reducing the impact of fires that do occur upon the structural system of the home by requiring structural assemblies used in one- and two-family homes to be protected in the same way they are required to be protected in other occupancies.

—Enabling the American fire service to do our job more safely and effectively by doing all of the above.

In closing, I wish to assure you that the challenge is not as difficult as you may think. Indeed the problem has already been solved. Look around you. This is a fire-safe building. We have applied the lessons of the past and the appropriate science and technology to design an assembly occupancy that provides a safe and secure environment for its occupants. We can do the same for residential occupancies. We have the knowledge and the technology to meet all the challenges, whether they be temporal, behavioral, financial, or environmental. All we need is the will to act. Thank you.

Senator DURBIN. Thank you, Mr. Van Dorpe, and thank you for what you do for a living. Men and women like you all across America keep us safe. We're grateful.

Mr. VAN DORPE. Thank you, Sir.

Seventy-five percent of the American fire service is volunteer.

Senator DURBIN. I know that. I know in Chicago we have a great fire department. We also, downstate, have a lot of great fire departments and volunteer efforts.

So thank you very much.

One of the things which was noted earlier, I want to mention to you. Tony Stefani, president of San Francisco Cancer Prevention Fund said in a recent study, "Firefighters show blood levels of PDBEs", these fire-retardant chemicals, "over 30 percent higher than the general population of California, and 60 percent higher than the general population of the United States."

One firefighter had a PDBE level 11 times greater than average for the general population. And the concentrations in the United States are 20 to 30 times higher than found in the general population of Japan, Hong Kong, and the United Kingdom.

So there is an environmental aspect to this, the exposure of your men and women as firefighters to these fire-retardant chemicals, which I guess Mr. Stefani is making a point to show us may have some long-term negative health impact.

Has there been any effort underway to measure this beyond his effort?

Mr. VAN DORPE. UL has conducted some smoke particulate studies. They began, I believe, in 2007. Those continue to today.

One of the things that we're finding is that, even when we wear all of our respiratory protection, we're still exposed to chemicals through dermal exposure. This stuff is migrating through our skins and into our bodies.

So the problem for us is getting more and more complex all the time. Every time we think we get a handle on how to deal with our exposure to chemicals, we find that there's another exposure out there.

Senator DURBIN. And you probably read the Chicago Tribune series, that there was a group calling themselves Friends of Firefighters who were testifying for the use of these flame-retardant chemicals. They were challenged. They had something to do with the State of Vermont, at least they said they did, but they were challenged as to whether they were speaking for firefighters or for the chemical industry.

Mr. VAN DORPE. I'm not familiar with the group.

Senator DURBIN. It's a point I hope you'll take a look at.

Mr. Schaefer, just for the record, you've stated it in general terms, but in politics and in the Chicago Tribune series, we follow the money.

Where was the money engaged in each of these undertakings?

Why did the tobacco industry decide they wanted to push flammability in furniture rather than a fire-safe cigarette? Why did the chemical industry want to push certain fire-retardant chemicals? What was the role of the furniture industry and such?

So, for the record, when it comes to UL, who is paying for your efforts in research?

Mr. SCHAEFER. For our efforts, they're self-funded through our public safety mission fund. Sometimes we do research work in partnership with organizations like NIST, and there, there would be grants and so on.

But for the most part, the research work we do is self-funded in the interest of advancing our safety mission.

Senator DURBIN. And to make it clear for the record, there are two approaches where—well, three, actually: legacy furniture, which was different than the furniture that we buy today; then furniture treated with fire-retardant chemicals, which you said does not produce any measurable impact of safety; and then barriers, which I assume is some sort of a cloth or fabric or something that stops the fire from spreading into the furniture. Three different levels, if I've got that correct.

Mr. SCHAEFER. Yes, that's correct.

Senator DURBIN. And the barriers, you say, don't necessarily have to include fire-retardant chemicals?

Mr. SCHAEFER. That's right, the barrier could be constructed even out of fiberglass, what you would see in insulation in your homes, so it's basically a neutral material. And there are other technologies that don't use flame retardants with barriers.

Senator DURBIN. I'm sorry, Senator Lautenberg missed the video. We want to make sure he gets a chance to see it later, but it was very dramatic in showing the difference in each.

So, Mr. Counts, as I understand what you're saying here, TB-117, the California standard relative to flame-retardant chemicals, kind of became a national standard, because furniture makers who are selling a lot of furniture in California are all around the country.

And now what I hear is, based on scientific evidence, the industry is backing away from the use of these chemicals, and the Governor in California has raised questions about the standard itself.

So I guess my basic question is, when it comes to furniture flammability today, is the furniture industry looking at their products in a different way in terms of how to make them safe, and not introduce toxic chemicals that may endanger customers?

Mr. COUNTS. Yes, Senator, we are.

In my written testimony, I noted that, in 2005, the furniture industry voluntarily phased out the use of PBDEs in our upholstery foam. EPA took action on that later in 2010, I believe.

So we're monitoring very closely European studies. We're working with our suppliers to make sure that all the research is avail-

able that's possible, working with Arlene Blum and others at Cal Berkeley, just to identify what chemicals may be trending at potential issues, and we look to phase those out as we can. And we'll be working with California on their new smoldering initiative as well.

Senator DURBIN. So you referred to something which I know nothing about, ASTM-1353, instead of the California TB-117.

Is this a new standard in terms of flammability and the safety of furniture you're recommending to CPSC and you think should be an industry standard?

Mr. COUNTS. ASTM-1353 is the embodiment of the Upholstered Furniture Action Council standard that was developed in 1977 to address smolder ignition.

If you look at the statistics on smolder ignition and the trends that I mentioned in my testimony, that along with smoke detectors and changing in lifestyles, decreasing smoking, et cetera, has added to the decrease in the trend there.

So that is the standard that we're looking to adopt.

Senator DURBIN. Officer Van Dorpe said something, which I thought to myself, I never thought of even looking for this. But he suggested, in his five things to make our homes safer, one of them is that we should be more sensitive to the furniture we buy, in terms of whether or not it is fire safe.

I cannot recall furniture ever being labeled fire safe. Is that something your industry does, advertises?

Mr. COUNTS. There is a UFAC hangtag that you can find on furniture, typically the retailer might not like hang tags on their furniture, and they'll rip that off, and you can't find it. There's the California TB-117 tag that's on there, occasionally. But those are the two standards.

Senator DURBIN. I'll bet you there aren't a half a dozen people in this room that would know what that meant if they saw it hanging from the back of a chair. I wouldn't have until this hearing.

Mr. COUNTS. Well, the hangtag is fairly descriptive, but like I said, sometimes it doesn't make it to the consumer.

Senator DURBIN. All right. Thank you much.

And that's the point I wanted to get to, Mr. Van Dorpe, is when it comes to our knowledge of what we're buying and whether it's safe, most consumers may not think of it, number one; and number two, wouldn't know what to look for.

Is there something that the firefighters recommend, in terms of that choice?

Mr. VAN DORPE. For a very long time, and this might be a little off topic, but for a very long time, the building industry said to the fire service, when we were concerned about the lightweight construction and taking mass out of buildings, where's your data, where's your data?

We finally have the data now, thanks to you all. So we've changed that discussion.

And oftentimes we hear when we talk about fire safety in the homes and sprinkler systems and fire-safe furniture and things like that, where the industries will say to us, well, consumers won't pay for that. I think we need to start asking them, where's your data?

Has anybody really asked? I mean, you can buy the safest car on the planet. There are manufacturers that will advertise their

cars that way, “We sell you the safest car. You’ll pay a little more for it, but we promise you it’s the safest car.”

We can do the same approach with our homes. We can sell fire-safe homes. We can sell fire-safe furniture. You want a five-star home or a four-star home? What’s the difference? One is more fire safe than the other.

We haven’t even made the attempt, and we really should.

Senator DURBIN. Good point.

Senator Lautenberg.

Senator LAUTENBERG. Thanks very much, Mr. Chairman.

Sorry I missed the testimony of all of the witnesses. They bring good information to us.

Chief Van Dorpe, firefighters are called on to rush into homes that are burning on a regular basis. Inside those homes are hundreds of household products—we talked about that—including many that contain chemicals.

Now, could we protect the health of the firefighters by reforming our Federal chemical laws to reduce toxic substances in the homes?

Before you answer, I want to tell you something that I worked on some years ago. We had a fire in Elizabeth, New Jersey. And there’s a lot of chemicals produced in the State of New Jersey.

And a couple of firemen were going into the burning building and their uniforms; their protective uniforms began to melt. And it was then that I wrote a law called “Right to Know”, which became the law.

And when you think about the sofas and fire retardants and things of that nature that work against safe opportunities in fighting a fire, and the Right to Know.

And in this case, I just wonder, is there something that we might do that would change the nomenclature on fire retardants and on every sofa, everything, have a defining message that says, hey, be careful, that this can accelerate a fire beginning because of the chemicals there? Is there anything that you think your firefighter friends and the volunteers might do to protect themselves by having more knowledge about what’s in these homes?

Mr. VAN DORPE. We can’t have too much knowledge about the environment that we’re operating in. And that environment is getting more and more complex all the time.

The challenge that we face is that, in the residential market, as soon as you start talking about our homes, most of the regulations, both for building codes and the restrictive regulations, go away. And that’s where most of our fires are, and that’s where most of our fire deaths are, and that’s where most of our exposures are.

So what American fire service needs for you to do is to take what we already know about making buildings safer, making products safer, and apply that to all products, not just to those that are in hotels or in assembly buildings or other places, but across the board.

We know how to do this. The mattress industry has demonstrated it.

In Europe, England, and in the United Kingdom, if you Google “home fire”, you know, home furniture fires, most of your responses come back with United Kingdom references, because they’ve done

the work, they've laid the groundwork and they've implemented a lot of these lessons.

So the information is out there. We just need to apply it.

Senator LAUTENBERG. What happened on 9/11, New Jersey lost 700 of its citizens in that calamitous occasion. But we still have had consequences of exposure by firemen and other emergency personnel. Still now, there are lots of them being treated and deaths are taking place because of the effects of the fumes and the dust and all of that.

And what happens when the toxic fumes are coming out there, black smoke, when they're burning? What happens to those who are trying to do their job, trying to save lives? What steps has your department taken to protect your firefighters from these health risks, these exposures?

Mr. VAN DORPE. We're doing several things, one of which is to ensure full encapsulation of the firefighters, the less skin we have exposed—the standard today is zero, no exposed skin—the less chemical exposure you have. Increasing our use of respiratory protection all the time, not just some of the time or when we think we really need it.

And then the other thing we do, we launder our equipment on a regular basis, because we find that if you don't do that, then those chemicals stay in your clothing, and then every time you put them on, you're re-exposing yourself, whether you're in a fire or not. So our turnout gear, our firefighting gear, gets laundered on a regular basis.

So we're taking what constructive steps we can to reduce that chemical exposure.

Senator LAUTENBERG. Last question for me, Mr. Chairman.

Mr. Schaefer, UL research suggests that flame-retardant chemicals in foam furniture do not provide significant benefits.

Based on your analysis, do you think there are safer and more effective ways than fire retardants to reduce fire hazards?

Mr. SCHAEFER. Fire retardants or alternate means?

Senator LAUTENBERG. Yes.

Mr. SCHAEFER. Yes, there are safe alternative ways, such as the use of fire barriers, where we saw very vividly there was a significant difference in the fire performance of furniture.

Senator LAUTENBERG. Define, if you would, a fire hazard. What would you define as a fire barrier?

Mr. SCHAEFER. A fire barrier is basically an inner covering that's placed over the foam material, for example. So it provides a shield, basically, between the source of the ignition, which could be the outer covering of the furniture, and the foam content.

And this technology has been used very effectively by the mattress industry, where they were also looking at flammability issues. And there's probably no piece of furniture that's in more intimate contact with a human being.

And they found, through the use of fire barriers, they could meet the flammability requirements and at the same time not introduce flame-retardant chemicals.

Senator LAUTENBERG. Mr. Chairman, I want to say thanks for bringing this subcommittee hearing up, because there's so much going on. And it took a Chicago Tribune expose to really bring at-

attention to one part of the thing that is never visible—you don't know—discharging toxic chemicals into the air, just by sitting on a sofa or something like that.

But we have to continue. When you talk about the number of deaths, Chief, that occur every day in the country as a result of fires, we've got to wake up to the alarm.

Senator DURBIN. Thanks, Senator Lautenberg. And thanks for your leadership on this.

Mr. Schaefer, before I conclude, I am struck by the fact that, though I'm a fan of CPSC—and we recently put a reform in place, we're now investing more Federal funds in the CPSC than we have ever, and I trust its leadership—when I listen to the fact that this started in 2003, this investigation, and it still isn't over, isn't finished—you talked about starting in 2008 and apparently getting into a lot more the impact of flame-retardant chemicals and ignition of furniture and so forth—I think I know the answer to this, and I think I may end up looking in a mirror, why is it that the CPSC takes so long to reach a conclusion, when, in your business, your not-for-profit undertaking, you seem to be able to do it in a shorter period of time?

Mr. SCHAEFER. I really can't comment what impacted CPSC. I do know, with other work we've done, there can be challenges with getting consistent, uniform test sample foams and things like that. I could speculate. I know there were considerable issues with import safety that came up in the last few years, and I'm sure that diverted some energy. And I know there were also funding challenges for CPSC in past years.

But I think, and this is where this subcommittee is to be applauded, sometimes it takes a spotlight on an issue to really get it elevated and acted upon.

Senator DURBIN. I still remember Chairman Tenenbaum's statement that they worked for 2 years to find a standard cigarette to use to determine whether the fire was being started in the proper way or in a consistent way. And 2 years seems like a long time to me, as a layman.

But let me just say thank you to this panel.

And, Chief, thank you very much.

Mr. Counts, thank you for your statements on behalf of the furniture industry.

Mr. Schaefer, very proud of UL, the work that you do in our State and around the country.

We wouldn't be here today were it not for the Chicago Tribune series. It really opened the eyes, not only of people in the Midwest, but all across the country and beyond about a very, very serious issue that affects every family with furniture. That's just about all of us. And every family that's concerned about that public health of the people living in their homes. Again, just about all of us.

And when it comes right down to it, I think what we found is there was, sadly, an unfortunate political effort under way to promote the use of chemicals in certain applications, which did not make us any safer. In fact, it endangered the public health of America.

It was a sinister and, in many respects, shameful exercise of our political system that led to the status that we found ourselves in

with these chemicals being used widely in the belief that they were keeping us safer.

We've learned a lot. And I think what I've heard today, the furniture industry and everyone has learned a lot in the process. I just hope that we can understand at the end there is a legitimate oversight role for Government, to take a look at the private sector and to keep us safe, whether it's the CPSC or EPA or many other agencies. And we have to make sure that we safeguard that, regardless of the administration, and make sure that we have the resources to deal with the challenges we face to get people the certainty they need in their lives.

PREPARED STATEMENTS

I'm going to ask unanimous consent that statements from the San Francisco Firefighters Cancer Prevention Foundation and the U.S. Fire Administration be included in the record.

Since there's no one here to object, that's going to happen.
[The statements follow:]

PREPARED STATEMENT OF SAN FRANCISCO FIREFIGHTERS CANCER PREVENTION FOUNDATION

Honorable members of the Financial Services and General Government Appropriations Subcommittee: First, I would like to apologize for not being physically present at this meeting. I had a previous commitment that I had to keep.

I would like to give you a little history about myself and the San Francisco Firefighters Cancer Prevention Foundation before my written testimony.

I am a retired Captain from the San Francisco Fire Department (SFFD) with 28 years of service. I spent the last 13 years of my career as an officer at Rescue 1, Station 1 and proud to say one of the busiest firehouses in the United States. After 26 years on the job, I contracted Transitional Cell Carcinoma in my right renal pelvis—a rare form of cancer usually found in people who work in the “chemical industry” according to my doctor. During my treatment and recovery, two more firefighters from my station also contracted Transitional Cell Carcinoma—only the common form, bladder cancer. It also seemed like every month we were attending a funeral of another firefighter that had lost his battle with some form of cancer. In 2006, with the support of the department's administration and San Francisco Firefighters Local 798, I formed the San Francisco Firefighters Cancer Prevention Foundation dedicated to the early detection and prevention of cancer in both active and retired firefighters. Since its inception we have conducted five major cancer screenings. Through these screenings we have identified five retired firefighters and one active firefighter with various forms of cancer. At the time of the screenings these individuals were not aware they had cancer.

Our foundation has also been involved in three studies. The first study (published in 2007) was conducted by the Department of Urology at UCSF and identified bladder cancer rates in the SFFD greater than the population in general and of major concern for the entire firefighting profession.

Our second study is currently being conducted by the Centers for Disease Control and Prevention (CDC) looking at causes of death in a cohort of 30,000 firefighters (5,538 participants from SFFD; 15,461 from Chicago Fire; and 10,652 from Philadelphia Fire) dating back to 1950. The study should be published with results sometime in 2014.

The third study is one that I will highlight in my testimony. It will be published very soon. The title of the study is “Halogenated Flame Retardants, Dioxins, Furans, and Other Persistent Organic Pollutants in Serum of Firefighters from Northern California”. The “Firefighters from Northern California” that it refers to is a cohort of 12 firefighters from San Francisco. I have been given permission by one of the lead researchers, Susan D. Shaw, DPH, to discuss various findings of the study.

The question posed by Senator Durbin: “How has the use of flame-retardant chemicals affected the lives of firefighters and their ability to do their jobs?”

We must first remember that firefighters are exposed everyday in the same manner that the population in general is to the effects of flame retardants that escape

from household products and settle in dust whether it be in the workplace or at home . . . But once a firefighter enters a burning building it is a completely different set of circumstances.

Firefighters are fully aware that we work in a “chemical cocktail” every time we enter a building on fire. Does that hinder the fire extinguishment? The definitive answer is, “Absolutely not.” It is our job to extinguish the fire, preserve life and property, and get the job done. The firefighters’ biggest fear is what occurs once the fire is extinguished and the “overhaul” process begins. It is during this period of time where “off gassing” occurs. Products of combustion have been extinguished but the emission of toxic gases continues. Most departments have Combustion Gases Indicators (CGIs) that are used to measure various toxins in the atmosphere once a fire is extinguished. Once the CGI indicates a “clear” atmosphere, firefighters are allowed to remove their scuba gear. The problem with this is that the CGIs have the ability to pick up a few toxic gases, but nowhere near the 100-plus toxic gases that remain in the atmosphere. We are now being told that even if all personal protective equipment remains in place brominated and chlorinated fire retardants have the ability to permeate the protective equipment worn by firefighters. Additionally, if this protective equipment is not properly decontaminated immediately when returning to quarters, firefighters risk continual exposures every time they don the protective equipment.

Flame-retardant chemicals (Polybrominated diphenylethers [PBDE]) are applied onto or in many common household goods, furniture foam, plastic cabinets, computers, small appliances, consumer electronics, wire insulation, back coatings for draperies, and upholstery to name a few. These gases are not picked up by CGIs. These chlorinated and brominated flame retardants produce both toxic dioxins and furans when they burn which have been proven to cause cancer. The significantly elevated rates of cancer reported in firefighters (Kang et al. 2008, LeMasters et al. 2006, Hansen 1990) include four types that are potentially related to exposure to dioxins and furans:

- Multiple myeloma;
- Non-Hodgkin’s lymphoma;
- prostate; and
- testicular cancer.

A question that lingers in our profession is do these chemicals combine synergistically with other toxins in the atmosphere and exacerbate the effect of other toxic carcinogens? What we do know is that our rate of contracting various forms of cancer is increasing. We are also fully aware that these flame-retardant chemicals bioaccumulate in our blood, fat tissue, and in mother’s milk.

Through our foundation, SFFD participated in a study examining the levels and patterns of halogenated compounds in the serum of the firefighters and compares contaminant concentrations in this cohort with those in the general population and other studies in the United States and worldwide. The cohort included 12 firefighters who willingly gave blood after two separate fires in San Francisco.

The study of our firefighters showed levels of PBDEs more than 30 percent more than the general population of California and more than 60 percent more than the general population of the United States. We had one firefighter with a PBDE level of 442ng/g of lipid weight which is 11 times greater than the average of the general population of the United States. The PBDE concentration in San Francisco firefighters was 20–30 times higher than levels found in the general population of Japan (Uemura et al. 2010), Hong Kong (Qin et al. 2011) and the United Kingdom (Thomas et al. 2006). With this information we are now hoping for a much broader study to take place.

Another issue that has to be addressed in regards to flame retardants is the rising cases of breast cancer we are seeing in our female firefighters in San Francisco. We have more than 200 female firefighters in San Francisco—the most of any major metropolitan city in the United States. Many of these women are nearing the age of retirement. To our knowledge there have been no major studies in regards to the health of female firefighters mainly because they have only been in the profession for 40-plus years. In our 40–49-year-old group of female firefighters we have 117 women. In that group we have had eight cases of breast cancer. The national average of breast cancer for the 40–49-year-old female group is 1 in 69. It is a known fact that PBDEs bioaccumulate in mother’s milk in the general population. It is also known that PBDEs are neurodevelopmental toxicants. The unknown is what level of PBDEs is in the mother’s milk of a female firefighter and what effect that is having on their children. Our foundation is in the preliminary stages of a study addressing the health issues of our female firefighters.

As far as the benefits of flame retardants, I think Dale Ray, a top official with the Consumer Product Safety Commission, who oversaw the 2009 tests at a labora-

tory outside Washington summed it up best in the Chicago Tribune series on flame retardants when he stated, “We did not find flame retardants in foam to provide any significant protection. Moreover, the amount of smoke from both chair fires (one treated, one not treated) was similar”. Ray noted that most fire victims die of smoke inhalation, not the flames.

It is probably too late for this generation of firefighters to be protected by a change in the current toxic flame-retardant standard. But the generations of firefighters to come will be forever thankful that this very important step was taken.

PREPARED STATEMENT OF THE UNITED STATES FIRE ADMINISTRATION

Mr. Chairman and members of the subcommittee, thank you for the opportunity to address this hearing and to provide the views of the United States Fire Administration (USFA) on the topic of furniture flammability and home fire safety. I appreciate the opportunity to discuss these important issues, which are of growing concern to the USFA.

BACKGROUND

Over the past 40 years, the number of lives lost fighting fires across the United States has decreased dramatically. In 1971, this Nation lost more than 12,000 citizens and 250 firefighters to fire. Acting to halt these tragic losses, the Congress passed Public Law 93-498, the Federal Fire Prevention and Control Act, in 1974, which established the USFA. Since that time, through data collection, public education, research and training, USFA has helped reduce fire deaths by more than one-half—making our communities and our citizens safer.¹

In spite of these efforts, America’s fire death rate continues to be one of the highest per capita in the industrialized world. Fire kills approximately 3,500 people and injures another 18,300 each year. Included in these fire fatalities are the approximately 100 firefighters who die on duty each year. Direct property losses due to fire reach more than \$12 billion a year. Most of these deaths and losses are preventable.¹

More than 80 percent of fire deaths occur in homes, an environment where citizens expect that they should be most safe. USFA is increasingly concerned about current trends that portend a looming catastrophe for the Nation: an aging population combined with changes in residential construction and use of highly flammable materials that create tremendous risk for fast-burning fires.

A summary of USFA’s concerns is outlined below:

- Since the 1960s and 1970s, materials used in home furniture and furnishings have changed dramatically. Furniture fabrication has changed. Furniture that was once made with heavy wood frames, cotton batting, and wool fabric is now made with light wood or plastic frames, polyurethane foam, and synthetic fabric. Fires involving this newer furniture grow much, much faster than fires in older furniture. Research has shown that the time available to escape a flaming fire in a home has decreased significantly from 17 minutes in 1975 to only 3 minutes in 2003; a change that has been attributed to the increased combustibility of home furnishings.² Carpets, draperies, clothing, entertainment systems, computers, and many other items commonly found in homes are also made of synthetic materials that have similar burning characteristics in an established fire in a home. Many of these materials are required to pass tests for resistance to small sources of ignition, but once ignited, they burn fast and hot.
- The significant changes in the materials found in our homes are not limited to the contents and furnishings that occupants bring into their homes. Important building elements are now made of synthetic materials that burn faster and hotter than traditional construction materials. Vinyl siding and exterior finishes, window and door frames, doors, foam insulation board, and other components made of synthetic materials all contribute to faster fire spread. Though some of these items are required to pass tests for resistance to ignition, they too, burn rapidly once lighted.

¹ USFA Web site: <http://www.usfa.fema.gov/about/>.

² Bukowski, R.W., et al., *Performance of Home Smoke Alarms: Analysis of the Response of Several Available Technologies in Residential Fire Settings*, NIST Technical Note 1455-1, National Institute of Standards and Technology, Gaithersburg, Maryland, February 2008.

³ *A Review of the Sound Effectiveness of Residential Smoke Alarms*, CPSC-ES-0502, U.S. Consumer Product Safety Commission, December 2004.

- The past 30 years have seen a dramatic increase in the use of lightweight construction assemblies such as trusses and other engineered assemblies in home construction and remodeling. These assemblies fail earlier during a fire than traditional dimensional lumber, all other factors being equal. Failure of these assemblies can result in structural collapse that threatens the lives of both the building occupants and responding firefighters.
- During this same time period, architects have made use of the wide span capabilities of these engineered structural assemblies to create remarkable and spacious home plans. These large wide-open spaces allow for faster fire development than smaller rooms found in older homes.
- Recent advances in energy conservation features have also had an impact on how a fire grows in a home. As a result of increasingly air-tight window and door fixtures, among other efficiency improvements, firefighters are experiencing an increase in the number of serious events such as “backdrafts” and “smoke explosions” that threaten the lives of both trapped occupants and firefighters.

Despite the many benefits to the advances in building technologies and materials in modern times, these advances have developed over time without expectation or analysis of the resultant cumulative effect on occupant safety from fire within residences. The resulting adverse impact to fire safety was not anticipated.

While many in the fire service have long-recognized the potential impact of changes in building technologies and material construction, only in recent years have the risks associated with these issues come under investigation. Recent research clearly shows that these innovations have dramatically changed the way a fire develops, grows, and spreads in a home. Fires in homes today develop, grow, and spread faster than ever before.

Concurrent with this dramatic change in the development and behavior of fires in the home, we are beginning to experience the much-heralded aging of our population. As we age, we become less able to awaken to the sound of a smoke alarm³⁴⁵ and we are less able to move quickly. The significant reduction in time available to escape a home fire combined with the declining sensory and mobility characteristics of older citizens is a recipe for disaster. USFA is concerned that the reductions in the number of fire deaths and injuries made over the last 40 years could be overcome by the potential for loss of life as a result of this deadly combination.

SITUATION

Citizens, firefighters, elected officials, and others across America share the USFA’s concern over the relatively high number of fire deaths in America’s homes, and the changing nature of fire hazards in our homes. The fire problem is becoming more complex, and it continues to defy simple fixes, despite the desire to find easy answers. The Consumer Product Safety Commission (CPSC) is taking on the important task of reducing the adverse impact of one of the known factors adding to the home fire hazard problem, the flammability of upholstered furniture. They are doing so with scientific research and consideration by agencies such as Underwriters Laboratories (UL) and the National Institute of Standards and Technology (NIST).

UL has recently completed an extensive project on furniture flammability. While UL’s work has not been fully published at this time, what we have seen demonstrates beyond all doubt that modern furniture presents a much greater fire challenge than the furniture used by our grandparents. While it is not the only way to improve fire performance of upholstered furniture, the positive impact that the current fire barrier technology can provide was clearly demonstrated in this work.

NIST has done outstanding multidimensional work addressing the subject of furniture flammability, and is continuing to explore several avenues that show great promise. USFA applauds the work done at NIST and looks forward to ongoing collaboration with their research team.

CPSC has proposed a regulatory approach that is based on the best science currently available. USFA supports the work that CPSC has done on the topic and recognizes their effort as a thoughtful approach to improving home fire safety by attacking one significant part, flammability of upholstered furniture, of an increasingly complex residential fire problem.

³ *A Review of the Sound Effectiveness of Residential Smoke Alarms*, CPSC–ES–0502, U.S. Consumer Product Safety Commission, December 2004.

⁴ Geiman, J.A., and D.T. Gottuk, *Reducing Fire Deaths in Older Adults: Optimizing the Smoke Alarm Signal*, Fire Protection Research Foundation, Quincy, Massachusetts, May 2006.

⁵ Bruck, D.A., I. Thomas, and A. Kritikos, *Reducing Fire Deaths in Older Adults: Investigation of Auditory Arousal with Different Alarm Signals in Sleeping Older Adults*, Fire Protection Research Foundation, Quincy, Massachusetts, May 2006.

CONCLUSION

USFA believes that the approach proposed by CPSC is an important step in improving home fire safety, but that it is not a final solution. As our collective understanding of the underlying science improves, we anticipate that there will be opportunities for voluntary improvements by the industry or a need for additional regulatory actions.

Thank you, Mr. Chairman, for providing this opportunity to provide the views of USFA on the topic of furniture flammability and home fire safety. I appreciate the opportunity to discuss these issues, and look forward to providing further information as requested.

ADDITIONAL COMMITTEE QUESTIONS

Senator DURBIN. We're going to keep the record open for 1 week, until noon on Wednesday, July 24. We may be sending you some questions along the way, follow-up questions.

[The following questions were not asked at the hearing, but were submitted to the witnesses for response subsequent to the hearing:]

QUESTIONS SUBMITTED TO INEZ M. TENENBAUM

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

CONSUMER PRODUCT SAFETY COMMISSION'S UPHOLSTERED FURNITURE FLAMMABILITY STANDARD

Question. In your testimony, you reference that much of the delay has resulted from the necessity of developing standard reference materials (such as standard cigarettes or standard foam) for testing. Are there remaining standard reference materials that need to be developed before you can move forward with finalizing the proposed rule?

Answer. The research to determine the specifications for Standard Reference Material (SRM) foam was completed in July 2012. Consumer Product Safety Commission (CPSC) staff is working with the National Institute of Standards and Technology and manufacturers to acquire SRM foam for testing as soon as possible. The staff also may conduct some additional work to select the best standard cover fabric for testing in accordance with the proposed rule.

Question. Under the rulemaking authorities that you currently have, what steps still remain in order to complete the standard, and what is your best estimate of when the standard might be completed?

Answer. The remaining steps in the rulemaking include:

- testing to determine the necessary revisions to finalize the proposed rule;
- testing the materials subject to the proposed rule to determine that compliance can be achieved;
- evaluating furniture constructed with compliant materials to estimate the reduction of deaths and injuries that could result from the proposed rule; and
- drafting the text of the final rule and developing the final regulatory analysis.

The staff will also continue to work cooperatively with the State of California's Bureau of Electronic & Appliance Repair, Home Furnishings & Thermal Insulation (BEARHFTI) as that agency proceeds with its work to revise Technical Bulletin 117 (CA TB 117). TB 117 currently contains performance standards that effectively require the use of flame retardants in upholstered furniture. Future changes in TB 117 could have an impact on the rulemaking proceeding. With those caveats, CPSC staff estimates, subject to Commission direction, completion of the final rule in 2015.

CALIFORNIA TECHNICAL BULLETIN 117

Question. What role does California TB 117 (CA TB 117) play with regard to your efforts to finalize a standard for upholstered furniture flammability?

Answer. There is a high degree of compliance with CA TB 117, not only in California, but also across the Nation. The existing CA TB 117 is essentially a de facto national standard. CPSC staff continues to work cooperatively with BEARHFTI on possible revisions to CA TB 117, and elements of the Commission's proposed rule are incorporated into California's latest draft revised regulation, known as CA TB 117-2012. As CPSC moves forward with its own rulemaking, the Commission staff will continue to monitor CA TB 117-2012 developments and will consider the potential effects of a revised California regulation on the level of consumer safety.

Question. Does the fact that the California Governor recently ordered that CA TB 117 be revised impact your efforts?

Answer. The revision of CA TB 117 will not impede CPSC's efforts to address the fire risk associated with ignitions of upholstered furniture. Throughout the upholstered furniture rulemaking process, CPSC staff has always envisioned a rule that does not require the use of flame retardants to meet performance standards. Revising or removing the open-flame requirement of CA TB 117 would eliminate the practical need for manufacturers to use flame retardants in upholstered furniture sold in California and across the United States. Accordingly, CPSC staff is carefully monitoring the progress of the CA TB 117 revision efforts.

Question. What will be the effect if CA TB 117 is completed prior to your standard?

Answer. As required under the Flammable Fabrics Act (FFA), CPSC preliminarily determined that the proposed rule was needed to address an unreasonable risk of fire injury or death to the public when it issued a proposed rule in 2008. The proposed rule included an assessment of reasonable alternatives to the proposal, including reliance upon the existing California regulations. If a revised TB 117–2012 were completed prior to our rule, CPSC would need to evaluate the revision to determine whether a Federal rule is still needed to address the fire risk.

Question. If California fails in their efforts to update CA TB 117, can CPSC preempt CA TB 117 with your proposed rule?

Answer. In general, section 16 of the FFA provides that whenever a flammability standard or other regulation for a product is in effect under the FFA, no State may establish or continue in effect a flammability standard or other regulation for that product, if the standard or regulation is designed to protect against the same risk of occurrence of fire as the FFA standard or regulation, unless the State standard or regulation is identical to the FFA standard or regulation. Because the CPSC rule and CA TB 117 are both designed to address the same unreasonable risk of occurrence of fire presented by flammable upholstered furniture, any Federal rule by CPSC would have preemptive effect. I should note, however, that the decision as to whether our rule has preemptive effect ultimately will be determined by the courts.

RESPONSE TO AMERICAN HOME FURNISHINGS ALLIANCE RECOMMENDATIONS

Question. The American Home Furnishings Alliance (AHFA) recommends that CPSC immediately adopt American Society for Testing and Materials (ASTM) 1353 as a Federal mandatory standard while continuing work on the CPSC proposed standard?

Answer. The Upholstered Furniture Action Council (UFAC) voluntary guidelines are based on tests prescribed in the ASTM E1353 test method. The vast majority of upholstered furniture sold in the United States conforms to the voluntary guidelines. While some elements of the CPSC's proposed flammability performance tests are similar to the ASTM 1353 standard, CPSC staff reviewed the ASTM/UFAC approach and concluded that it was inadequate because conforming furniture can still ignite and burn from smoldering cigarettes. The CPSC proposal incorporated significant improvements to the ASTM/UFAC method and is more stringent. Mandating the ASTM E1353 method, as embodied in the current UFAC guidelines, would impose modest costs, but also provide only negligible safety benefits.

Question. How does ASTM 1353 differ from what CPSC is proposing?

Answer. There are two principal, substantive differences between the ASTM tests and the smoldering ignition tests in CPSC's proposed rule. The first involves relatively small differences in the test methods themselves. The second involves larger differences in the acceptance criteria that determine the stringency of the performance tests.

With regard to the test methods, the ASTM method measures char length from the lit cigarette placed on an upholstery mockup. The mockup is encased in a box that artificially restricts airflow to an unrealistically low rate. The cover fabric is classified as either "Class 1" or "Class 2" based on the char length resulting from the test. If the char is within the 2-inch specified length, the cover fabric is Class 1 under the UFAC guidelines and may be used without restriction; if the char exceeds the 2-inch specified length, the fabric is Class 2 under the UFAC guidelines. For Class 2 fabrics, the use of a smolder-resistant barrier (typically polyester batting) beneath the cover fabric is prescribed to provide additional smolder resistance for the finished article of furniture. The UFAC/ASTM approach represents the status quo in the industry; virtually all fabrics are classified as Class 1, although in tests conducted by CPSC staff, some Class 1 fabrics were so smolder prone that they produced dangerous smoldering or transitioned to flaming combustion even when a

polyester batting layer that would have been required for Class 2 fabrics was present.

The main difference is in the acceptance criteria. CPSC's proposed rule classifies furniture as "Type I" or "Type II" based on acceptance criteria of the proposed test. CPSC's proposed Type I smoldering test for upholstery cover fabrics uses the basic UFAC/ASTM mockup test configuration, but controls airflow without a box, limits maximum allowable smoldering time to 45 minutes, and limits mass loss of the (nonflame-retardant) polyurethane foam substrate beneath the fabric to 10 percent. This test is a much better indicator of the likelihood of continued combustion and fire growth, and it identifies more effectively smolder-prone cover fabrics.

While most cover fabrics are still expected to pass the smoldering resistance test and be used in complying, Type I furniture, fabrics that fail the smolder-resistance test can only be used in Type II furniture. Type II furniture is that which is constructed with a fire-blocking barrier beneath the cover fabric. Compliant Type II barriers must pass a stricter smolder-resistance test; they must also pass a flame-resistance test that simulates the potential transition from smoldering to flaming combustion.

Question. What is your response to AHFA's recommendation that your proposed standard rely on the use of compliant components (individual pieces that are used to construct the final furniture) instead of on the use of composite testing (testing of the completed furniture)?

Answer. CPSC's proposed rule relies on the use of complying component materials, rather than on composite assemblies, consistent with AHFA's recommendation. The principal advantage of this approach is economic efficiency—suppliers of the various components can test and certify their materials, and furniture manufacturers can choose from among many complying materials, without having to duplicate compliance tests for each of thousands of potential combinations. Balanced against the desire for low cost, however, is the need to ensure that complying components will perform as intended when assembled into the wide range of constructions and geometries in finished articles of upholstered furniture. CPSC staff will continue to be mindful of these issues as they move forward with the rulemaking.

FLAME-RETARDANT CHEMICALS

Question. The Environmental Protection Agency (EPA) has jurisdiction over evaluating the toxicity of flame-retardant chemicals under the Toxic Substance Control Act but, in 1977, CPSC attempted to use their authority under the Federal Hazardous Substances Act to ban the use of a flame retardant—"tris", a harmful carcinogen—from use in children's clothing. Though the ban was overturned on procedural grounds, could the CPSC use this authority to take similar steps to ban the use of certain toxic flame-retardant chemicals in upholstered furniture?

Answer. While EPA has authority to regulate flame-retardant chemical risks under the Toxic Substances Control Act, CPSC has authority under the Federal Hazardous Substances Act (FHSA) to regulate a "hazardous substance", as defined in the FHSA, that is intended or packaged in a form that is suitable for use in the household. In other words, the CPSC does not regulate chemicals, but it can regulate a product, such as upholstered furniture, if that product contains a hazardous substance and the Commission is able to make the requisite findings under the FHSA. See 15 U.S.C. 1261(f) and (q)(1)(B); 1262(f) through (i).

CPSC staff has conducted risk assessments for fabric, foam, and barrier flame retardants. Staff identified one foam flame retardant, known as TDCP or "chlorinated tris", as a potential carcinogen. To regulate upholstered furniture containing this or other flame retardants under the FHSA, CPSC would have to find that upholstered furniture containing the chemical is a "hazardous substance" under the FHSA and that cautionary labeling would not adequately protect public health and safety. A "hazardous substance", as defined in the FHSA, includes a substance that is toxic and "may cause substantial personal injury or substantial illness during or as a proximate result of any customary or reasonably foreseeable handling or use." See 15 U.S.C. 1261(f)(1)(A). FHSA also requires, among other things, a final regulatory analysis of the costs and benefits of the regulation, a description of alternative approaches to regulation, as well as an analysis of the costs and benefits of those alternatives, and why they were not chosen as part of the final rule.

To date, CPSC staff has worked cooperatively with EPA staff outside of the FHSA rulemaking context to identify and address potential risks associated with a category of flame-retardant chemical compounds known as polybrominated diphenyl ethers (PBDEs) that had been used in upholstered furniture to meet CA TB 117. EPA proposed a Significant New Use Rule (SNUR) for two PBDEs (penta- and octa-BDE) in 2004 and another SNUR (deca-BDE) in 2012. Penta- and octa-BDEs are

now out of production, and deca-BDE production is expected to cease by December 31, 2013. Going forward, CPSC staff and EPA staff will continue to work cooperatively on issues related to flame retardants.

QUESTIONS SUBMITTED TO JAMES J. JONES

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

FLAME-RETARDANT CHEMICALS

Question. Tris(1,3-dichloro-2-propyl)phosphate (TDCP) is the chlorinated version of a chemical known as “tris” that the Consumer Product Safety Commission (CPSC) attempted to ban from children’s sleepwear in the late 1970s after it was found to be carcinogenic. Despite its similarity to tris, TDCP is a widely used flame retardant in furniture cushions and baby products. Along with components of Firemaster 550, Environmental Protection Agency (EPA) has placed a chlorinated flame retardant, Tris(2-chloroethyl)phosphate (TCEP), on a list of chemicals that will be reviewed next year under its Toxic Substances Control Act (TSCA) work plan. However, EPA did not place TDCP on the list. Why not?

Answer. In March 2012, following the development of the “TSCA Work Plan Chemicals: Methods Document”, a screening process to identify chemicals for review based on their combined hazard, exposure, persistence, and bioaccumulation characteristics, EPA identified 83 work plan chemicals for risk assessment under TSCA.¹ Of these, an initial seven chemicals were identified for risk assessment development in 2012.² Although TDCP has chemical characteristics similar to other flame retardants, it did not meet any of the specific listing criteria identified in the TSCA Work Plan methods document. Specifically, it was not identified as a known or probable human carcinogen by the Integrated Risk Information System, International Agency for Research on Cancer, or National Toxicology Program, and was not reported as being in children’s products through the 2006 Information Use Reporting or the Washington State Children’s List. Consumer products were not a screening category for step 1 in the Work Plan development process.

On June 1, 2012, EPA identified 18 additional chemicals from the TSCA Work Plan, which the Agency intends to review and for which the Agency will develop risk assessments in 2013 and 2014, including three flame-retardant chemicals:

- Bis(2-Ethylhexyl)-3,4,5,6-tetrabromophthalate (TBPH);
- 2-Ethylhexyl-2, 3,4, 5-tetrabromobenzoate (TBB); and
- Tris(2-chloroethyl)phosphate (TCEP).³

EPA is currently developing a strategy, scheduled for completion by the end of this year, to address these three flame-retardant chemicals as well as a broader set of flame-retardant chemicals. This effort will assist EPA in focusing risk assessments on those flame-retardant chemicals that pose the greatest potential concerns. EPA anticipates initiating the risk assessments in this category of chemicals in 2013.

Question. Polybrominated diphenyl ethers (PBDEs) are a large class of flame-retardant chemicals that have been shown to be harmful to humans and the environment. What can be done to remove products with these chemicals from American homes and properly dispose of them?

Answer. EPA’s regulatory efforts for addressing concerns with PBDEs include a Significant New Use Rule (SNUR) issued in 2006, a recently proposed SNUR, and a proposed test rule for PBDEs. EPA has also engaged producers and importers in negotiations and commitments to voluntarily phase out certain PBDEs.

In 2003, the sole U.S. manufacturer agreed to voluntarily phase out production of pentaBDE and octaBDE by December 31, 2004. In conjunction with this phase out, EPA issued a SNUR in 2006 which designated the manufacture and import of six PBDE compounds as a significant new use. The SNUR required persons who intended to manufacture or import tetra-, penta-, hexa-, hepta-, octa- and nonaBDE to submit information to EPA for review before engaging in the new use. Additionally, the SNUR ensured that no new manufacture or import of pentaBDE or octaBDE could occur after January 1, 2005.

Following negotiations with the EPA in 2009, the sole importer and two domestic manufacturers of decaBDE voluntarily agreed to stop producing decaBDE by December 31, 2012, for all uses except certain military and transportation uses, and

¹ <http://www.epa.gov/oppt/existingchemicals/pubs/wpmethods.pdf>

² <http://www.epa.gov/oppt/existingchemicals/pubs/workplans.html#2012>

³ <http://www.epa.gov/oppt/existingchemicals/pubs/workplans.html#2013>

to stop providing decaBDE for all uses by December 31, 2013. On April 2, 2012, the EPA proposed to amend the 2006 SNUR by expanding the scope to include processors of PBDEs and articles containing PBDEs. The proposed amended SNUR would also designate the manufacturing, importing, and processing of decaBDE, including in articles, as significant new uses. Along with the proposed SNUR, EPA also proposed a test rule for those persons that manufactured, imported, or processed commercial PBDEs after December 31, 2013. With a test rule in effect, manufacturers, importers, and processors could be required to conduct health and safety studies to inform data gaps.

To aid companies in moving to safer alternatives, EPA recently published, with public participation through its Design for the Environment program, a draft report: "An Alternatives Assessment for the Flame-Retardant Decabromodiphenyl Ether." Public comments were due by September 30, 2012, and EPA expects to finalize the report in the coming months.⁴

While these efforts may result in a reduction of products containing PBDEs in American homes, we would note that CPSC has authority to require recalls if it determines that a product presents an unreasonable risk of injury or death. EPA is not aware of CPSC requiring a recall of furniture as a result of the product containing PBDE. In terms of disposal, PBDE-containing furniture can be disposed of in municipal solid waste landfills.

FUTURE EFFORTS REGARDING FLAME RETARDANTS

Question. EPA has started a new plan to re-evaluate all of the flame retardants on the market with the latest testing and analysis methods to see if any of these chemicals poses a risk to the public's health. Once you've completed the new plan, what will the next steps be?

Answer. As indicated in the response to question one, EPA is currently developing a strategy, scheduled for completion by the end of this year, on the three flame-retardant chemicals identified earlier this year, as well as on a broader set of brominated flame retardant chemicals.

The strategy will assist EPA in focusing its risk assessments efforts on those flame-retardant chemicals that appear to pose the greatest potential concerns. EPA anticipates initiating the risk assessments on brominated flame retardants in 2013. If an assessment indicates significant risk, EPA will evaluate and pursue appropriate risk reduction actions. If an assessment indicates no significant risk, EPA will conclude its current work on that chemical.

EUROPE BANS OR GREATLY RESTRICTS FLAME RETARDANTS

Question. Furniture flammability is not just an issue here in the United States. However, many European countries have taken alternative steps to ensure flammability standards can be met without causing public health concerns. The United Kingdom has banned the use of conventional, flexible polyurethane foams in the manufacture of upholstered furniture for sale. In addition, many European countries have banned the use of PBDEs and greatly restricted other flame-retardant chemicals. Does EPA examine how other countries are regulating flame-retardant chemicals?

Could any of these methods be applied here in the United States?

Answer. EPA is aware of what other countries are doing on flame retardants and will consider any data or assessments that are available to us. EPA's authority for regulating PBDEs and other industrial chemicals must be consistent with TSCA, this country's chemicals management legislation. While TSCA provides the authority to take action to prohibit or limit the manufacture, import, or use of a chemical, the requirements needed to take that action have proven very challenging.

CPSC also encourages the use of barriers to reduce the use or need for chemical flame retardants while still meeting, or exceeding flammability standards.

In 2006, CPSC published a regulation on the allowable rate of heat release from a mattress;⁵ this has effectively reduced both the size and growth rate of fires in mattresses that were in compliance with the new standard. Additionally, in 2008, CPSC proposed a rule establishing flammability standards on the smolder propensity of upholstered furniture.⁶

⁴ <http://www.epa.gov/dfepubs/projects/decaBDE/about.htm>

⁵ <http://www.cpsc.gov/businfo/frnotices/fr06/rnattsets.pdf>

⁶ <http://www.cpsc.gov/businfo/frnotices/fr08/furnflamm.pdf>

TOXIC SUBSTANCES CONTROL ACT

Question. Following the series of articles in the Chicago Tribune that highlighted the potential health risk of flame retardant chemicals, many of my constituents responded that the Federal Government should have protected the public from these chemicals. What steps has EPA taken outside of legislation to more effectively regulate hazardous chemicals such as flame retardants?

Answer. EPA engaged in negotiations in 2003 and again in 2009 with manufacturers and importers of PBDEs. EPA considers commitments from chemical companies to voluntarily phase out certain chemicals from the market an important strategy of chemical management. EPA is using SNURs to ensure if any PBDEs that have been voluntarily phased out were to be reintroduced into commerce, they would first be subject to EPA's review.

In addition to those actions, EPA believes that its current approach to identifying chemicals for review and assessment utilizing the "TSCA Work Plan Chemicals: Methods Document", is a significant step to ensuring the safe use of chemicals. If, through this process, EPA identifies chemicals that pose a concern, the Agency will evaluate and pursue appropriate risk reduction actions, as warranted, using existing TSCA authority. If an assessment indicates no significant risk, EPA will conclude its current work on that chemical. However, identification of chemicals as Work Plan Chemicals does not mean that EPA would not consider other chemicals for risk assessment and potential risk management action under TSCA and other statutes. EPA will consider other chemicals if warranted by available information. EPA will also continue to use its TSCA information collection, testing, and subpoena authorities, including sections 4, 8, and 11(c) of TSCA, to develop needed information on additional chemicals that currently have less-robust hazard or exposure data.⁷

QUESTIONS SUBMITTED TO GUS SCHAEFER

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

UNDERWRITERS LABORATORIES TESTING ON UPHOLSTERED FURNITURE FLAMMABILITY

Question. In 2008, Underwriters Laboratories (UL) initiated a series of tests to determine the most-effective ways to improve flammability of upholstered furniture exposed to small open flames (namely, candles or lighters). UL has completed all phases of the study and is currently finalizing the data for an upcoming report. During your testimony you showed two powerful videos that demonstrate the way modern furniture burns. But that is only part of your current research.

When do you expect to finalize and publish the results of the study referenced in your testimony?

Answer. We expect to finalize and publish our findings in a report due to be released in early fall 2012. The project report for the initial investigation (material, mock-up, and furniture tests), or Phase I, is still on schedule for the aforementioned release date. Phase II (living room burns) and Phase III (house fires with egress estimations) will be finalized and published in the subsequent 2-4 months.

Question. Will the results be made available to the public?

Answer. Yes, UL intends to post our reports upon completion on the Upholstered Furniture Flammability project Web page: www.ul.com/fireservice. This Web page was created in July 2011 to provide the public with an overview of the project, our published findings, fire demonstration videos, and other related material.

RESPONSE TO TESTIMONY FROM THE AMERICAN HOME FURNISHING ALLIANCE

Question. Testimony from the American Home Furnishing Alliance (AHFA) has outlined several concerns regarding the repeatability of flammability testing and the difficulty this testing presents for manufacturers and for creating new standards. Is it difficult to produce reliable, repeatable tests to properly evaluate flammability performance?

Answer. Results of fire tests and other physical tests are impacted by the method itself (e.g., equipment and reagents, procedures, environment conditions, etc.), the operator, and the sample.

Standard Test Methods such as those developed by the Consumer Product Safety Commission (CPSC), ASTM International, the International Organization for Standardization (ISO), the Upholstered Furniture Action Council (UFAC), and UL minimize variations from testing and the test operators by clearly defining a fixed set

⁷ <http://www.epa.gov/oppt/existingchemicals/pubs/workplans.html#not>

of equipment requirements, measurement methodologies, and procedural protocol. The sample thus becomes the main source of variation. In fact, there are defined protocols (ASTM Committee E11 quality and statistics, ISO TC 46/SC 8 Quality—Statistics and performance evaluation) for verifying that the sample, and not the test method, is the limiting repeatability factor.

By following good scientific practice, reliable and repeatable tests for evaluating flammability properties can be developed. UL, ASTM International, and ISO have long histories of developing standard test methods. The developed tests are used on a daily basis for research, manufacturer quality control, product certification, and are referenced in fire and building codes worldwide.

Question. AHFA also raised some concerns regarding the incorporation of barrier technology into upholstered furniture. How would you describe the comfort level of furniture containing barriers?

Answer. While UL did not factor in “comfort” implications into the scope of its formal research. However, the furniture UL created for its research that incorporated barriers looked, felt, and sounded (for example, no crackling or squeaks when sitting or rising) the same as furniture made without the barrier.

UL did investigate a variety of representative barrier types including “high-loft” barriers and “flat” barriers as a part of this research, but did not test all available barriers. Depending on what type of barrier is used in different parts of the furniture (cushions, arm rest, flat surface, etc.), some of these barriers could result in furniture that may look, feel, and possibly sound different than furniture without the barrier.

Question. Do you believe incorporating barrier technology into furniture would significantly increase the cost to manufacture?

Answer. From our written testimony: UL’s general experience tells us that industry is usually able to develop cost-effective and efficient approaches to address enhanced safety requirements.

Question. In your testimony, you discuss the disproportionately higher number of home fire deaths related to upholstered furniture. In AHFA testimony, Mr. Counts discusses how improvements such as smoke alarms and residential sprinklers have greatly diminished home fire deaths. In the past 30 years, what factors have you found to be responsible for reducing the number of home fires related to upholstered furniture?

Answer. While smoke alarms and more recently, residential sprinklers, have contributed to a reduction in fire deaths related to upholstered furniture, the fact remains that fires beginning with upholstered furniture and mattresses/bedding are responsible for more home fire deaths than any other item (National Fire Protection Association [NFPA] report “Home Fires that Began with Upholstered Furniture”, 2011). During the 5-year period of 2005–2009, these fires accounted for 19 and 14 percent of deaths and 7 and 10 percent of the injuries, respectively. They also accounted for \$824 million in direct property damage. Contemporary upholstered furniture, or furniture constructed with modern synthetic material, leads to a disproportionate number of potentially preventable fire deaths as evidenced by the NFPA report:

“Overall, fires beginning with upholstered furniture accounted for 2 percent of reported home fires but 1 of every 5 (19 percent) home fire deaths.”

One of the most notable fire protection technologies since the 1980s is the introduction of residential fire sprinklers. But like the current furniture flammability discussion around barrier fabrics, the mandating of residential fire sprinklers has faced resistance by many within the construction industry because of added cost to homes.

The city of Scottsdale, Arizona, for instance, mandated the installation of residential sprinklers since 1986. The Scottsdale Fire Department published a report detailing the positive effects of their sprinkler ordinance. Key findings include:

- More than 50 percent of the homes in Scottsdale (41,408 homes) are protected with fire sprinkler systems.
- From 1986–2001, there were 598 home fires. Of the 598 home fires, 49 were in single-family homes with fire sprinkler systems:
- There were no deaths in sprinkler-installed homes.
- 13 people died in homes without sprinklers.
- There was less damage in the homes with sprinklers:
 - Average fire loss per home with sprinklers: \$2,166
 - Average fire loss per home without fire sprinklers: \$45,019.
- Annual fire losses in Scottsdale from 2000–2001 were \$3,021,225, compared to the national average of \$9,144,442.

The full report can be downloaded from the Home Sprinkler Coalition site at <http://www.homefiresprinkler.org/fire-department-15-year-data>.

QUESTIONS SUBMITTED TO ANDY S. COUNTS

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

CONSUMER PRODUCT SAFETY COMMISSION FLAMMABILITY STANDARD

Question. Earlier testimony has shown increased flashover (combustion) times, resulting in fires that burn more quickly, leaving less time for consumers to escape homes in the case of fire, and also less time for firefighters to respond to fires.

Do you believe current upholstered furniture flammability standards are adequately protecting consumers from the risk of furniture fires?

Answer. Yes, the voluntary Upholstered Furniture Action Council (UFAC) standard as reflected in American Society for Testing and Materials (ASTM) 1353 is adequately protecting consumers from the risk of furniture fires. Despite the absence of a mandatory national standard, incidents of deaths and injuries from upholstered furniture fires have steadily declined over the last few decades in spite of a large increase in the population of this country (see if we can quantify from census figures). A recent National Fire Protection Association report said that there has been a 93-percent decline since 1980. While many factors have contributed to this decline, the safer construction criteria developed by UFAC undoubtedly played a significant role in the downward trend in the number of ignitions of upholstered furniture.

Regardless of the extrapolation method used to estimate the national level death and injury figures, the risk level associated with death or injury in a cigarette- or small, open-flame-ignited upholstered furniture fire is lower than many other risks commonly accepted by individuals without concern. Despite population growth, the risk of fire fatalities and the number of upholstered furniture fires continue to fall. In recent years, the risk has been extremely low: In 1980 the death rate for cigarette fires was 4.34 per million population; by 2002 this death rate had been reduced to 0.53 per million population. The death rate for small open-flame fires in 1980 was 0.61 per million population; by 2002 this death rate had been reduced to 0.53 per million population. A risk level of under 1 per million is considered by experts to be de minimis, below many everyday risks that are essentially unavoidable.

Question. In your opinion, what is the most-effective way to reduce upholstered furniture flammability?

Answer. We believe that the fire statistics demonstrate the effectiveness of ASTM 1353 and this standard achieves that without the use of flame-retardant chemicals. Since smolder ignition continues to be to the primary source of ignition for upholstered-furniture-related fire deaths and injuries, Consumer Product Safety Commission (CPSC) should mandate the consensus based and proven requirements of ASTM 1353. Making it a Federal mandatory standard would further enhance the level of compliance achieved by this voluntary standard because noncompliant domestic and imported product would now be subject to the standard. In addition, the labeling requirements of a mandatory standard would help to educate that consumer on the potential dangers of upholstered furniture flammability.

CPSC has been working on a proposed new upholstered furniture flammability standard for the last 5 years. The proposed standard could be met without utilizing flame-retardant chemicals. It is my understanding that a significant portion of the delay in finalizing the rule has been establishing standard reference materials for testing.

Question. In your opinion, what additional issues does CPSC still need to resolve before finalizing the rule?

Answer. CPSC has allowed the perfect to become the enemy of the good. Instead of embracing the proven voluntary standard that is ASTM 1353, CPSC has attempted to make improvements to the testing methods. This has resulted in test methods that have not been shown to be repeatable or reproducible. Until CPSC subjects their test methods to round robin testing, they will be unenforceable. The test methods embodied in ASTM 1353 have been proven both repeatable and reproducible in laboratory round robin studies.

CPSC recently reported on a barrier material that it believes is effective against smolder and open-flame ignition. We need to obtain more information about this product so it too can be tested in a round robin to determine if it will be effective with a large number of textiles and a large number of configurations. This is essential because we are not aware of any other barrier material that can comply with the CPSC proposed test method for barriers.

Both CPSC and Underwriters Laboratories (UL) have shown that barriers significantly reduce flammability compared to other strategies for reducing flammability. However, in your testimony, you indicated several concerns with barriers, particularly increased manufacturing costs and impact on “saleability”.

Question. How do manufacturers incorporate barriers into their furniture?

Answer. Some commercial applications of furniture are required to meet the requirements of California Technical Bulletin 133 (TB-133). This standard requires the use of flame-resistant barriers in construction and the majority of these barriers utilize flame-retardant chemicals. In fact, it is our understanding that the barrier that UL used in its video shown at the hearing incorporates a fair amount of flame-retardant chemistry. The perceived human and environmental concerns with flame-retardant chemistry make furniture manufacturers reluctant to incorporate these barriers into residential furniture where consumers are exposed to them on a 24/7 basis unlike commercial furniture used in the hospitality industry.

Unlike a mattress that is a single horizontal slab, the various geometries and spatial relationships of furniture prevent the application of a barrier as a slip on sock or bag. Instead these barriers must be incorporated by upholstering the barrier prior to the cover fabric therefore doubling the amount of labor typically involved. Surveys have shown that this process increases manufacturing costs an average of \$150 for a chair and \$300 for a sofa. This would equate to an increase of approximately \$300 and \$600, respectively, at retail.

Question. Are there any other technologies manufacturers are currently considering to address furniture flammability?

Answer. The industry has been working to address the issue since the 1970s and this effort has resulted in a movement from smolder prone components (legacy furniture) to smolder resistant ones (modern furniture). This movement has contributed to the dramatic decrease in deaths and injuries associated with upholstered furniture fires. We continue to explore new component options as the technology evolves.

Question. You testified that there are no quick fixes to upholstered furniture flammability since a variety of materials and combinations are needed to satisfy customers’ needs and tastes. Do you believe that it’s likely that consumers are not taking into account flammability and the changing nature of furniture materials with regard to flammability? If given a choice—being aware of the increased risk over legacy materials and the quick ignition time—don’t you think that might influence consumers’ purchases?

Answer. Keep in mind that the movement away from “legacy materials” was due to their propensity to ignite when exposed to a smolder ignition source. As the data trends indicate this movement has undoubtedly saved lives. Some purchasers of new upholstery receive the UFAC hangtag which warns them that upholstery may burn rapidly and emit toxic gases. A number of consumers have contacted us regarding these warnings so we think that there is a good level of awareness that furniture will burn. A national standard would include a labeling requirement that could be used to further educate consumers as to the potential dangers of upholstered furniture flammability.

Question. Since legacy furniture burns much more slowly, are there some parts of the legacy furniture that it might make sense for industry to return to manufacturing? If not, why not?

Answer. The Federal Government’s original investigation into smoldering ignition found that the materials being used in the so called legacy furniture were the most prone to cause smoldering ignition when exposed to a lit cigarette. It has taken several years to remove these products from the marketplace and the absence of such legacy products is one of the reasons that cigarette ignition of upholstered furniture has declined over the years. By reintroducing these materials, we are concerned that the downward trend would reverse and we would see a commensurate increase in the incidents of smoldering ignition of upholstered furniture.

Question. Barriers in between the fabric and the cushion of furniture are being considered as an improvement over flame-retardant chemical materials. If manufacturers are reluctant to use some of the new barriers due to reasons of comfort, are there some other options or technologies available? If using a barrier, could more material be used alongside it to add comfort?

Answer. Barriers are used to address the risk of small open-flame ignition. As discussed above the risk of this type of fire occurring in the home is already extremely small and difficult to address because it is often the result of arson or child play. CPSC has found that many of the open-flame ignitions are not “addressable” within the meaning of their statute. Regardless of this fact, industry would embrace barriers if they could maintain “saleability”. This would involve several factors including health concerns, comfort, and affordability. Existing barrier technology does not

meet these criteria. CPSC should move to address the primary risk of smolder ignition by adopting ASTM 1353. Resources can then be focused on evaluating small open-flame solutions to determine their effectiveness and feasibility.

CONCLUSION OF HEARING

Senator DURBIN. I want to thank everybody for attending, and I hope you got as much out of this hearing as we did.

Once again, thanks to the Chicago Tribune for leading us in this effort.

[Whereupon, at 4:10 p.m., Tuesday, July 17, the hearing was concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

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