UPHOLSTERED FURNITURE FLAMMABILITY:
ANALYSIS OF COMMENTS FROM THE CPSC STAFF'S JUNE 2002 PUBLIC MEETING

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Executive Summary

The U.S. Consumer Product Safety Commission (CPSC) is considering regulatory options to address the risk of fire associated with ignitions of upholstered furniture by small open flame sources. On June 18-19, 2002, the CPSC staff held a public meeting to obtain information from interested parties. This package presents a summary of the comments from the public meeting and an update on recent related outside activities.

The agency received 25 comments from industry, other government agencies, fire safety organizations and individuals regarding a variety of issues. These included oral presentations, with written supporting statements, at the June 2002 public meeting from 19 individuals representing 14 organizations.

The comments reflected a range of positions. Most of the commenters provided data and recommendations to CPSC regarding either technical issues or cost and other economic effects associated with a possible standard. Others discussed issues related to flame retardant (FR) chemicals, human factors considerations or general policy or legal points.

The staff is considering the various technical comments, and has revised its draft small open flame performance standard to streamline some provisions and to reduce testing costs and other potential economic burdens. The staff is also working with the California Bureau of Home Furnishings & Thermal Insulation (BHF) on revising that state's upholstered furniture regulation. Further, the staff continues to work with the U.S. Environmental Protection Agency (EPA) to develop a possible EPA Significant New Use Rule (SNUR) for FR chemicals that may be used to meet a CPSC flammability standard. A SNUR would allow for additional scientific review of FR treatments to determine whether restrictions on the use of any such chemicals may be warranted. This effort will help ensure that no hazardous FRs would be used, and that no significant adverse environmental effects would result.

The staff presented several options in an October 2001 briefing package to the Commission; these options remain available for Commission consideration. The staff intends to forward to the Commission an updated regulatory options package later this year. This package will contain the staff's revised draft standard and recommendations regarding options to address fire risks associated with upholstered furniture.

United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

DATE: FEB 4 2003

TO : The Commission
Todd A. Stevenson, Secretary

Through: W.H. DuRoss, III, General Counsel WHD III
Patricia Semple, Executive Director PS

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SUBJECT: Upholstered Furniture Flammability: Analysis of Comments from the CPSC Staff's June 2002 Public Meeting

This package presents a summary and staff analysis of comments and recommendations submitted by interested outside parties at the U.S. Consumer Product Safety Commission (CPSC) staff's June 18-19, 2002 public meeting on upholstered furniture flammability. The Commission staff held this meeting to obtain information and comments from the public on various issues prior to Commission consideration of regulatory options. CPSC received comments from furniture, textile, chemical and other industry representatives, as well as from other government agencies and fire safety groups.

This package also presents an update on activities outside of CPSC that are related to the agency's work on upholstered furniture. Some of the public meeting comments pertain to these outside activities.

I. Background

In 1994, the Commission granted a petition (FP 93-1) from the National Association of State Fire Marshals (NASFM) requesting rulemaking under the Flammable Fabrics Act (FFA) to address upholstered furniture fire risks. NASFM suggested adopting existing California flammability regulations, or other suitable existing standards. The Commission granted the petition in part, and issued an advance notice of proposed rulemaking (ANPR) on the

NOTE: This document has not been reviewed or accepted by the Commission.
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specific risk of small open flame-ignited fires. The Commission denied the petition with respect to large open flame-ignited fires, and deferred action with respect to cigarette-ignited fires pending a CPSC staff evaluation of a) the level of conformance to existing voluntary industry guidelines, and b) the overall level of cigarette ignition resistance among products on the market.

After the Commission issued the ANPR, the staff developed a draft small open flame performance standard. This standard was designed to reduce ignitability and flame spread, in order to prevent or limit the early stages of fire growth following exposure to a small open flame (most open flame-ignited fires involve children playing with lighters, matches or candles). It contained performance tests for seating areas and dust covers, the most commonly ignited locations on furniture. The draft standard relied heavily on the performance of cover fabrics, based on CPSC laboratory tests indicating that these fabrics were the most important determinant of small open flame performance.

CPSC laboratory testing suggested that flame retardant (FR) upholstery fabrics - identified by manufacturers as a likely means of limiting fire growth - would also reduce the risk of upholstered furniture fires ignited by smoldering cigarettes. While the cigarette ignition risk is attributable to a relatively small proportion of currently produced upholstered furniture, the projected societal costs associated with this risk are large.

The staff presented the draft standard and supporting data, along with the Commission-directed cigarette ignitability evaluation (which found high levels of voluntary conformance and cigarette ignition resistance), in a staff briefing package ("Upholstered Furniture Flammability: Regulatory Options for Small Open Flame and Smoking Material Ignited Fires," October 1997). The staff recommended that the Commission defer action until the agency could collect and analyze additional scientific information to ensure that FR upholstery fabric treatments that manufacturers might use to comply with a flammability standard would not result in adverse health effects to consumers. In view of the likelihood that action to reduce the small open flame risk would also affect the cigarette ignition risk, the Commission voted to defer action, and to gather additional information on FR chemicals. CPSC held a public hearing on this issue in May 1998, and received comments and scientific data from interested parties.

In the Commission's 1999 appropriation, Congress directed the agency to sponsor a National Academy of Sciences (NAS) study on potential health risks associated with FR chemical treatments for upholstery fabrics. This study, completed in June 2000, identified a number of FR compounds that could be used without posing health

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risks to consumers, and recommended further study for other compounds.

Since the 1998 public hearing, the CPSC staff worked to address the concerns of industry and other stakeholders, to revise the draft small open flame standard, to develop additional supporting information, and to encourage voluntary action. In the most significant recent revision to the draft standard, the staff included an alternate seating barrier test that would allow the use of fire-blocking barrier fabrics (or "interliners") between upholstery cover fabrics and filling materials. The staff forwarded the revised draft standard to the Commission in another briefing package ("Briefing Package on Upholstered Furniture Flammability: Regulatory Options," October 2001).

A. October 2001 Briefing Package

The October 2001 briefing package presented a summary of the staff's technical information on upholstered furniture. The staff concluded that a small open flame standard a) could effectively reduce the risk of fire; b) was technically and economically feasible; c) would afford reasonable flexibility to the industry; d) would preserve consumer choice of furniture constructions and upholstery materials; and e) would not result in significant offsetting chemical risks to consumers or the environment. The staff continued to harmonize its draft standard, to the extent possible, with ongoing efforts in California to amend that state's existing upholstered furniture flammability regulation. Some unresolved FR chemical risk issues remained following the NAS and CPSC staff assessments; however, planned rulemaking by the Environmental Protection Agency (EPA) and ongoing chemical industry research would help address those issues.

The package presented options for Commission consideration with respect to possible continuing action (e.g., a notice of proposed rulemaking, or NPR) on the small open flame ignition risk, and with respect to possible action (e.g., an ANPR) on the cigarette ignition risk.

The volume and complexity of the issues led the staff to recommend that the Commission defer action and share the information in the package with the public before considering a proposed rule or other options. The purposes of this recommendation were to ensure full public participation in the regulatory development process, provide an opportunity for outside groups to present any new studies or other relevant information, and help the Commission determine the need for further action. The Commission accepted the staff recommendation, and published a

notice in the March 20, 2002 *Federal Register* announcing the June 18-19, 2002 staff public meeting and soliciting written comments.

The October 2001 package also recommended denying an NASFM petition (FP 99-1) requesting polyurethane foam labeling, on the basis that labeling would not effectively reduce the risk to consumers, and that the ongoing small open flame standards development proceeding may adequately address the risk without a warning label provision. The Commission also accepted this staff recommendation, and sent a letter of denial to NASFM in January 2002.

The CPSC staff shared the draft standard with various stakeholders in industry, government and the fire community through presentations and discussions at conferences and meetings in early 2002. While the seating barrier option was generally well received, furniture and textile industry representatives expressed concerns about the complexity and potential cost of testing under the sampling provisions in the draft standard. In response to those concerns, the staff reviewed the sampling provisions and identified ways to streamline the testing requirements (e.g., by reducing test frequency and sample sizes) without diminishing the standard's level of safety. These sampling revisions have been incorporated into the staff's latest working draft of the standard, and will significantly lower projected industry testing and recordkeeping costs.

B. Outside Activity Update

The October 2001 briefing package described some ongoing activities outside of CPSC that are related to the staff's standards development work. This section presents an update on the status of regulatory activities in California, at EPA, in Europe and in New York State. CPSC received comments regarding these activities at the June 2002 public meeting.

i. California TB-117 Revision

The California Bureau of Home Furnishings and Thermal Insulation (BHF) is the only regulatory authority in the U.S. with mandatory flammability rules in effect for residential upholstered furniture. The CPSC staff and BHF have been working cooperatively in the development of the CPSC staff's draft small open flame standard. In 1999, BHF initiated a project to amend Technical Bulletin (TB) 117, the mandatory standard for all upholstered furniture sold in California. The CPSC staff has participated in this effort by sharing data and discussing technical issues.

The current TB-117 was issued in 1975. TB-117 contains component performance requirements for both cigarette and small open flame ignition resistance. FR filling materials are used to comply with the small open flame provisions. TB-117 contains minimal fabric requirements, from the CPSC clothing textiles regulations (16 CFR 1610, originally a Department of Commerce standard issued in 1953), and no composite assembly requirements; thus, FR fabrics and fire-blocking barriers are not necessary.

In February 2002, BHF released a revised draft TB-117 with upgraded performance requirements. A number of its provisions are similar to those of the CPSC staff's draft standard. Although there are technical differences in test requirements between the CPSC staff and BHF draft standards, the impact of these differences on the way upholstered furniture is constructed may not be great, since either standard could result in the use of a mix of FR fabrics and barriers. Industry comments to BHF suggest that the draft revised TB-117 may be somewhat more difficult and costly to meet than the CPSC staff's draft standard (TB-117 would still require FR foam or other fillings, and would involve more composite testing of assembled components, even if manufacturers chose to use barriers).

During 2002, BHF held a series of meetings with industry and other stakeholders to receive comments and recommendations on various aspects of the revised draft of TB-117. BHF is currently evaluating these comments and is considering whether further revisions may be appropriate. BHF plans to propose amendments to TB-117 in early- to mid-2003. The CPSC staff is continuing to work cooperatively with BHF toward harmonizing the two standards to the extent possible. A CPSC flammability rule for upholstered furniture would generally pre-empt any non-identical requirements of the California regulation addressing the same risk of injury.

ii. EPA / SNUR Development

For most upholstered furniture, the likely method of complying with the staff's draft small open flame standard would be to use FR chemical fabric treatments. The CPSC staff investigated the potential health effects that could result from exposure to these chemicals. In the 1997 briefing package, the staff concluded that some FR treatments would probably not pose health risks, but noted the lack of scientific data and sought ways to evaluate possible chemical risks more thoroughly.

In 1998, the CPSC staff began working with staff in EPA's Office of Pollution Prevention and Toxics (OPPT) to develop a possible Significant New Use Rule (SNUR) on FR chemicals manufactured for use in fabric treatments to meet a new flammability standard for upholstered furniture. EPA

representatives outlined their plans for this cooperative effort at the Commission's May 1998 public hearing.

If promulgated, a SNUR would require manufacturers to report their intent to EPA before producing FR chemicals for furniture use. EPA would review the potential risks to consumers, workers and the environment. The SNUR could be used to obtain additional data from manufacturers if needed. The presence of a SNUR would help ensure that harmful chemicals are not used to meet a CSPC standard.

The CPSC staff considers the SNUR to be an essential ingredient of the regulatory development effort. A draft SNUR would, ideally, be issued concurrent with any CPSC proposed rule. The effective date of a final SNUR is generally the date of publication of the proposed SNUR in the *Federal Register*. The EPA staff has also been monitoring the TB-117 revision project in California, since some FR chemicals could be used to meet the fabric requirements of the revised draft of that standard.

The CPSC staff is continuing to work closely with EPA staff to complete a draft SNUR in a timely fashion. Under the current proposed schedule, a SNUR could be ready for proposal by mid-2003.

iii. European Chemical Regulations

Comprehensive risk assessment studies of FR chemicals, including some that may be used in upholstery fabrics to meet a CPSC flammability standard, have been underway in Europe for several years. These studies include potential effects on human health and the environment. Much recent attention has focused on bromine-containing flame retardants, particularly the class of polybrominated diphenyl ethers (commonly referred to in the U.S. as polybrominated diphenyl oxides), or PBDEs. In 2001, the European Union (EU) Council of Ministers approved a recommendation by the European Parliament to ban one PBDE, penta-bromodiphenyl ether (penta-BDE). This compound is used in some plastics and electronics equipment, and in some polyurethane foam. The EU risk assessment concluded that penta-BDE is chronically toxic in humans and persistent in the environment. The 2001 CPSC staff health risk assessment did not cover penta-BDE since it is not a candidate for FR fabrics use in upholstered furniture to meet a CPSC flammability standard.

The EU is also conducting risk assessments and considering possible future action on two other PBDEs, deca-BDE and octa-BDE. Deca-BDE accounts for most of the world's commercial brominated FR production, with many plastics-related uses. It is the most widely used treatment for predominantly synthetic upholstery fabrics in the U.K., and is a principal candidate for use in meeting a

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possible CPSC standard (octa-BDE is not a reported candidate for upholstery fabric use). The 2001 CPSC staff risk assessment concluded that exposure to deca-BDE from upholstered furniture would not have significant health effects on consumers. The principal concern about deca-BDE is its environmental persistence, and the possibility that it could break down into more harmful compounds. The preliminary EU risk assessment concluded that potential human and environmental exposure to deca-BDE is low and does not warrant EU regulatory action.

In 2002, the Swedish Ministry of Environment undertook its own study of brominated flame retardants. This study, to be completed in 2003, may contribute additional information to the EU risk assessment program. EU members cannot generally take unilateral action without EU approval.

A future candidate for EU risk assessment is the brominated FR hexabromocyclododecane (HBCD), another chemical that could be used in furniture fabric treatments. The 2001 CPSC staff risk assessment concluded that exposure to this compound would not result in significant human health effects.

The EU is also sponsoring a risk assessment for antimony trioxide (AT), a compound often used as a synergist with deca-BDE in textile backcoating treatments in the U.K., and a candidate for use in meeting a possible CPSC standard. The 2001 CPSC staff health risk assessment noted incomplete data for AT regarding potential exposure via inhalation. The risk assessment concluded that the more likely oral or dermal routes of exposure to AT would not present a significant health risk to consumers.

In summary, efforts are underway in Europe to develop more complete risk assessments to support possible regulatory decisions on a variety of FR chemicals. The EU's concerns are primarily related to environmental pollution rather than health effects to consumers from exposure to consumer products. Only one compound, penta-BDE (which is not a candidate for use in FR upholstered furniture fabrics), has been banned, and there is no indication at this time that others will soon be restricted. The CPSC staff is following the progress of the European studies, and will consider any new information they may provide.

iv. New York Cigarette Safety Legislation

In 2000, the New York State legislature passed a measure requiring that all cigarettes sold in the state be self-extinguishing when dropped on soft furnishings such as upholstered furniture and mattresses and bedding. Under this legislation, the State Fire Administrator must establish regulations by January 1, 2003 for all cigarettes sold in New York after July 1, 2003. The

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legislation also calls for the State Office of Fire Prevention and Control to consider whether complying cigarettes may present increased health risks to consumers. Massachusetts, Minnesota, New Jersey and Rhode Island have reportedly considered similar legislation, but none has yet been enacted.

The CPSC staff has maintained contact with the New York State Fire Administrator through an ASTM voluntary fire standards subcommittee (E-5.15, Contents and Furnishings) to monitor the progress of this activity. The cigarette safety requirements, based on a test method developed by the National Institute of Standards and Technology (NIST), are scheduled to be issued in January 2003, and to become effective in April 2003. Thus, cigarettes that are less likely to ignite soft furnishings will presumably be available in New York in 2003. One manufacturer, Philip Morris International, introduced a reduced ignition propensity (IP) version of their Merit brand cigarettes in selected U.S. markets in October 2000.

While New York will likely issue a new regulation, efforts in Congress to pass national legislation have not been successful. In 2002, legislation was introduced by Senators Durbin (IL), Brownback (KS) and Markey (MA) to require "fire safe" cigarettes meeting guidelines established by CPSC. This bill was modeled after legislation proposed in the House of Representatives a number of times over the past two decades by the late Representative Moakley (MA). Another bill, developed by the American Home Fire Safety Act Coalition (the National Association of State Fire Marshals and others), that may be proposed in the House and Senate in 2003 would require CPSC to issue fire safety standards for cigarettes, upholstered furniture, mattresses and bedding, and candles. The prescribed standard for cigarettes would be equivalent to the New York regulation.

The CPSC staff is monitoring the progress of these activities, as well as state and national data on cigarette fires. Lower IP cigarettes may reduce fire deaths and injuries associated with ignitions of upholstered furniture and other home furnishings, but the extent of any such reduction is not yet known. The staff intends to obtain and evaluate lower-IP cigarettes from New York, to help quantify their hazard reduction potential. CPSC received a number of comments on this subject at the June 2002 public meeting.

II. June 2002 Public Meeting Comments

The Commission received a total of 25 public comments in response to the March 20, 2002 *Federal Register* notice announcing the public meeting. A list of the commenters (with identifying abbreviations or acronyms) appears on the following page.

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U.S. Consumer Product Safety Commission Staff
June 18-19, 2002 Public Meeting on
Upholstered Furniture Flammability

The following parties submitted written comments in response to CPSC's March 20, 2002 *Federal Register* notice (text references are in parentheses):

- Akzo-Nobel Chemical Co. (Akzo)
- American Fibers & Yarns Co. (American)
- American Furniture Manufacturers Association (AFMA)
- American Textile Manufacturers Institute (ATMI)
- Alliance for the Polyurethanes Industry (API)
- Calico Corners, Inc. (Calico)
- California Bureau of Home Furnishings & Thermal Insulation (BHF)
- Covington Industries, Inc. (Covington)
- Decorative Fabrics Association (DFA)
- Fire Retardant Chemicals Association (FRCA)
- INDA, Association of the Nonwovens Industry (INDA)
- James F. Hoebel (Hoebel)
- Joan / Mastercraft Fabrics, LLC (Joan)
- Kravet, Inc. (Kravet)
- McKinnon-Land-Moran, LLC (MLM)
- National Association of State Fire Marshals (NASFM)
- National Cotton Council of America (NCC)
- Polyurethane Foam Association (PFA)
- Quaker Fabric Corp. Of Fall River (Quaker)
- University of Surrey, Polymer Research Center (U. Surrey)
- Upholstered Furniture Action Council (UFAC)
- Wearbest Sil-Tex Mills, Ltd. (Wearbest)
- Weave Corporation (Weave)
- Wellman, Inc. (Wellman)
- Zoltek, Inc. (Zoltek)

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The comments include oral presentations, with written supporting statements, at the June 18-19, 2002 public meeting from 19 individuals representing 14 organizations. The staff filed a meeting log, containing a general account of the public meeting, with the Office of the Secretary. A copy of the log (with attached *Federal Register* notice) appears at **Tab A**. The Commissioners received copies of all written submissions and copies of the videotaped recording of the meeting itself. Copies of the videotape are also being provided to the meeting participants. The written comments and the videotape will be available to the public.

The public comments generally covered issues identified by CPSC in the March 20, 2002 notice. They represented a mix of groups favoring and opposing CPSC regulation of upholstered furniture. While the comments raised no new issues that were not previously considered, the comments did provide a) additional supporting details on technical and economic topics, and b) an overview of the various stakeholders' positions on the Commission's activities.

Sixteen of the submissions discussed technical issues. Eighteen discussed economic issues. Seven discussed FR chemical issues, and two discussed human factors-related issues. Seven of the commenters also gave general position statements or discussed policy or legal questions. A summary of the written submissions and oral presentations and the staff responses is presented below for each topical category. Staff memoranda with point-by-point responses to each comment are in the attached tabs.

A. Technical Issues

Sixteen commenters raised technical issues; these dealt chiefly with the content of the CPSC staff's draft small open flame standard and the supporting CPSC laboratory work. The Directorate for Engineering Sciences (ES) and Directorate for Laboratory Science (LS) memos addressing these comments appear at **Tab B** and **Tab C**, respectively.

i. Barriers

Comments:

Eight commenters (NASFM, AFMA, ATMI, API, PFA, Wellman, INDA, Zoltek) discussed the use of fire-blocking barriers to comply with the draft standard. Some technical comments supported this option, stating that barriers would provide adequate protection for filling materials, thereby limiting flame spread and fire growth, and increasing escape time in the event of a fire. Others questioned whether barriers alone would be sufficiently protective. One

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commenter (API) reported on tests they conducted in which some barriers that met the CPSC staff's draft standard did not protect filling materials when tested with certain heavy weight cover fabrics. Another (Wellman) recommended the use of a small flame ignition source in both seating and alternate barrier tests.

Staff Response:

Fire barriers have long been studied as a means of reducing fire growth resulting from both open flame and smoldering combustion. Both phenomena can result from small open flame ignition. The CPSC staff's objective in including a barrier test alternative was to reduce economic disruption and preserve a reasonable level of consumer choice among upholstery fabrics, while at the same time affording small open flame protection. For many fabrics, barriers can offer a practical yet effective alternative to FR treatments.

Barriers are not designed to prevent ignition; rather, they are intended to resist the thermal insult of a burning cover material. Thus, barriers cannot be adequately evaluated using a small open flame source. To compensate for the likelihood that fabrics used over barriers would not resist small open flame ignition, a larger, wooden "crib" ignition source is used in the draft standard's alternate seating barrier test. This test helps ensure that barriers will slow or prevent full involvement of the upholstered article in a fire.

The staff has observed a range of fire performance among different kinds of barriers. CPSC laboratory tests of individual manufacturers' products revealed that some barriers that comply with the draft standard may not always provide as high a level of ignition resistance as other complying barriers or FR fabrics. The staff continues to investigate alternative ignition source configurations, and will revise the draft standard test method if warranted.

ii. California TB-117

Comments:

Four commenters (NASFM, BHF, INDA, UFAC) discussed the technical approach and other issues related to the draft revised California TB-117. Two commenters (NASFM, INDA) recommended adopting or harmonizing with TB-117; one (UFAC) criticized the revised TB-117 tests as inadequately correlated with full scale product performance, and discouraged CPSC from adopting the California approach. The BHF representative at the public meeting presented the rationale for their decision to retain "redundant"

filling material component tests, i.e., to provide maximum escape time and assure adequate fire safety.

Staff Response:

The CPSC staff has worked with BHF during the development of the staff's draft small open flame standard, and has communicated regularly with BHF about various aspects of the TB-117 revision. After considering the California approach and reviewing the available laboratory data and other information, the CPSC staff concluded that a composite mockup test approach would provide adequate protection, and that redundant component requirements for filling materials were not necessary. Under the CPSC staff's draft standard, manufacturers would not be prohibited from using FR fillings or other FR materials; however, the CPSC staff is unaware of any current foam technology that would add significantly to the level of small open flame protection. BHF is investigating the correlation between their small scale tests and the full scale performance of finished articles of upholstered furniture; the CPSC staff will consider the results of this investigation when they become available. The CPSC staff sees no compelling reason at this time to adopt separate filling material requirements.

Comments:

Three commenters (BHF, API, Wellman) discussed the acceptance criteria in some of the revised California tests; these criteria are based on mass (i.e., weight) loss rate. Two commenters (BHF, API) favored the mass loss rate approach; one commenter (Wellman) recommended against a maximum mass loss limit, citing tests of mockups with heavy weight fabrics in which the mockups exceeded the mass loss criteria (due to the mass of the fabric itself) without posing a significant risk of continued fire growth.

Staff Response:

The CPSC staff investigated several approaches, including mass loss and heat release rate measurements, in its standard development process to address the small open flame risk. The staff regards approaches such as mass loss and heat release to be more appropriate for fire scenarios in which ignition sources are large and the objective is to reduce the possibility of a flashover fire (i.e., one in which the heat of combustion progresses to the point where everything in a room ignites and burns explosively). The staff considers the approach of preventing ignition and limiting combustion at the earliest stages of fire growth to be more effective than controlling mass loss rate or kinetic energy release for household small open flame fire scenarios like childplay, involving small flame ignition sources like lighters or matches.

iii. Fabrics and Filling Materials

Comments:

Eight commenters (API, ATMI, AFMA, UFAC, NASFM, NCC, FRCA, PFA) discussed various aspects of fabric and filling material fire performance. Some mentioned component vs. composite testing and the role of fabrics in addressing small open flame ignitability. Others described potential effects of FR treatment on the cigarette ignition resistance of certain predominantly cellulosic fabrics (chiefly cotton), and expressed concern that increasing small open flame resistance would decrease cigarette resistance in some cases. Three commenters (API, ATMI, NCC) recommended establishing standard fabric classifications for testing purposes.

Staff Response:

The staff agrees that composite testing more accurately relates to the performance of actual furniture than does component testing. The CPSC staff's draft standard utilizes a hybrid composite seating mockup test approach, combining the component approach of testing fabrics or barriers over standard foam fillings, and the composite approach of an assembly of components (under which any combination of actual materials may be tested to establish compliance). CPSC laboratory tests have demonstrated that the properties of actual filling materials have little or no effect on the small open flame ignition resistance of full-scale chairs.

The staff recognizes the importance of considering smoldering ignition resistance in developing a small open flame standard. One of the staff's earliest stated goals was to reduce the risk from small open flame ignitions without increasing the risk from smoldering cigarette ignitions. CPSC laboratory testing showed that FR treatments for most fabrics, including most heavy cellulosics that would otherwise be the most cigarette-ignition-prone, would confer not only small open flame resistance, but also cigarette resistance. The draft standard does limit smoldering combustion as well as flaming combustion: both types can result from small open flame ignition.

The staff's testing of paired sets of FR vs. non-FR fabrics identified a number of cellulosic fabrics that did not exhibit improved cigarette resistance after FR treatment. Only one of these, however, went from non-igniting before treatment to igniting after FR treatment. Seating mockups using this 100% heavy cotton fabric did not meet the draft small open flame standard either before or after treatment, so the fabric would not remain on the market if a standard were in effect.

The staff has not established any standard fabric classifications in the draft standard, due to the wide variety of fabric characteristics and finishes. During barrier testing, for example, the staff evaluated the effect of several kinds of fabrics to determine whether a fabric classification scheme could be reliably developed. The results indicated that such a scheme would be difficult to implement due to the inconsistent performance of fabrics of similar weight and fiber content. FR fabrics may be easier to classify, but the staff considers the industry to be better informed about fabric similarities that would streamline compliance testing. The draft standard allows, but does not require, manufacturers to classify fabrics for testing purposes.

B. Economic Issues

Twenty commenters provided statements or data on economic issues. Most of these comments addressed either the use of fire-blocking barriers to comply with the staff's draft small open flame standard, or the manufacturing costs and related effects associated with FR treatment and testing. Some commenters mentioned other potential adverse economic impacts of a standard, e.g., on product aesthetics or retail sales. The Directorate for Economic Analysis (EC) memo addressing these comments appears at **Tab D**.

i. Barriers

Comments:

Twelve commenters (NASFM, AFMA, UFAC, API, FRCA, ATMI, Quaker, Weave, DFA, INDA, Wellman, Zoltek) discussed the commercial feasibility of seating barriers. Most supported the CPSC staff's inclusion of a barrier alternative in the draft standard. They noted that barriers would a) afford manufacturers and suppliers more flexibility in designing and constructing upholstered furniture, b) reduce costs associated with testing and recordkeeping, c) ease limitations on small production runs and Customers' Own Materials (COM) production orders, d) preserve the desirable feel and other aesthetic properties of many upholstery cover fabrics, and e) avoid the use of FR chemicals. Two commenters (DFA, UFAC) stated that FR polyester batting that could serve as a complying seating barrier would be an especially desirable development, but is not yet available.

Staff Response:

The staff recognizes that a barrier alternative may be preferred by many fabric and furniture manufacturers, especially for use with certain cover fabrics that are difficult to treat or would be aesthetically diminished by FR treatment. These firms have previously expressed concern that retailers and consumers may

demand non-FR fabric choices. Drop-in replacement components like FR polyester batting could be especially advantageous, and could expand the barrier market to lower-priced furniture, if these components' costs were more competitive with FR fabrics. Other material technology advances, such as inherently-FR fiber fabrics, may also become a cost-effective solution. Any of these alternatives may provide similar safety benefits to those of FR fabrics.

ii. Costs of a Standard

Comments:

Seven commenters (UFAC, Quaker, Joan, Culp, Weave, American, Wearbest) provided estimates of manufacturing costs associated with FR fabric treatments and production sample testing. Some of the larger firms would reportedly conduct their own compliance tests, whereas smaller firms (i.e., most of the industry) would generally not. The firms provided varying cost estimates; one description of the effects of compliance testing on production line processing speed suggested that most fabrics would have to be re-processed at least once, substantially slowing the lines and raising production costs. One commenter (Quaker) expressed concern that the resulting expected higher prices of up to 15 percent would encourage consumers to defer new retail purchases of furniture and resort to second-hand furniture or slipcovers.

Staff Response:

The staff acknowledges that production costs would probably increase if the draft standard were imposed. Most of the firms providing data had submitted information on this issue previously. Based on data from a variety of U.S. and U.K. sources, however, the staff considers some of the submitted cost estimates to be excessive. For example, costs were likely overstated for FR backcoating processes and equipment, as well as test labor and materials. Other firms' estimates were lower than the staff's estimates of average costs, chiefly because of scale economies associated with these firms' large fabric production runs. Overall, the staff considers its cost estimate range to be reasonable.

The staff's estimates of costs to smaller firms of FR treatment and testing by fabric finishers were based on the assumption that testing frequency would be high and that finishers would sample from production runs from every fabric manufacturer. As finishers and manufacturers gain experience, however, they would probably be able to demonstrate compliance for a range of fabrics with similar physical characteristics, thereby reducing testing costs.

The staff agrees that unit price increases may influence consumers' retail purchasing decisions. To the extent that consumers defer purchases of new, complying upholstered furniture, the introduction of safer products into the market could be delayed. At the estimated $22-34 (or about 3-5 percent) average price increase per item with FR fabrics (in the lower- and mid-priced mass market), the staff does not expect substantial purchase deferrals.

iii. FR Fillings and Fabrics

Comments:

Four commenters (NASFM, AFMA, PFA, FRCA) recommended that the Commission consider flammability requirements for filling materials, especially polyurethane foam. They cited the synergistic effect of the relation between fabrics, fillings and other materials on fire performance, and stated that a standard taking all these components into account would be most effective.

Staff Response:

The staff investigated the likely effectiveness of FR foams and other filling materials, and found that these materials contributed little to preventing fire growth following small open flame ignition. The additional costs that would be associated with imposing such requirements are therefore not warranted. Manufacturers are free to use FR foams or other fillings in complying furniture; however, the staff has observed none in laboratory testing that would make the difference for otherwise non-complying products.

Comments:

Three commenters (NASFM, BHF, MLM) discussed the applicability of emerging technologies that may be useful in meeting a flammability standard. They identified fabrics made with inherently-FR fibers as a particularly promising approach. One commenter (MLM) noted the availability of (their own) inherently-FR fiber yarn that could be used in upholstery cover or barrier fabrics to achieve small open flame ignition resistance.

Staff Response:

The staff is aware of a number of emerging-technology materials that may be or are already being marketed for use in upholstered furniture or other seating products (e.g., commercial-market furniture, airline seating, etc.). Some of these materials would probably be highly effective at reducing the small open flame ignition risk. Although prices of some of these new materials may

be too high for manufacturers of lower-priced upholstered furniture, other manufacturing costs and aesthetic and chemical issues may be avoided by using such fabrics.

C. Flame Retardant Chemical Issues

Seven commenters discussed health or environmental effects of FR chemical use. The Directorate for Health Sciences (HS) memo addressing the toxicity-related comments appears at **Tab E**. The Directorate for Economic Analysis (EC) memo, which addresses environmental issue-related comments, appears at **Tab D**.

Comments:

There was general agreement among the commenters that the use of any FR treatments shown to present significant human health risks as a result of their use in upholstered furniture should be prohibited. Some industry commenters (NCC, UFAC) pointed out the existence of uncertainties or incomplete scientific data for some candidate FR compounds, suggesting that CPSC should resolve all such issues before considering further regulatory action. Other commenters (NASFM, U. Surrey) noted that non-hazardous FRs are available and should be used to comply with a flammability standard.

Staff Response:

The CPSC staff agrees that FR chemicals presenting significant health risks as a result of exposure from upholstered furniture should not be used. The CPSC staff health risk assessment identified several likely candidate FRs that could be used without presenting health risks. Among the ongoing exposure studies is research on one important compound, antimony trioxide, to determine whether one route of exposure (inhalation) may present a risk to consumers. The staff continues to work with EPA to develop a SNUR that would apply to FR chemicals manufactured for use in upholstered furniture. This would help reduce the likelihood that harmful chemicals, from either a health or environmental standpoint, would be used to meet a CPSC flammability standard.

Comments:

One commenter (U. Surrey) described recent regulatory developments regarding certain FR chemicals in Europe. EU risk assessments are in progress for various FRs that would be suitable candidates to help meet the CPSC staff's draft standard, including antimony trioxide (AT), decabromodiphenyl ether (deca-BDE) and hexabromocyclododecane (HBCD). Another commenter (NCC) recommended that CPSC consider applying EU "eco-label" requirements for FRs used to meet a CPSC rule.

Staff Response:

The CPSC staff is monitoring developments in the risk assessment and regulation of FR chemicals in Europe. While the staff considers it prudent to conduct exposure studies, these chemicals will not necessarily be regulated by the EU Council of Ministers. The EU "eco-label" program, under which chemicals requiring labeling for various human health or environmental hazards cannot be present in products at levels above 0.1 percent by weight, is hazard-based. By contrast, CPSC's approach under the Federal Hazardous Substances Act (FHSA) is risk-based, i.e., it requires that exposure and risk must be considered in addition to toxicity. The staff does not consider the EU eco-label approach to be consistent with CPSC's approach of reducing chemical risks under the FHSA.

Comment:

One commenter (American) raised concerns about air quality impacts associated with incineration of discarded upholstered furniture containing FR chemicals. They urged CPSC to consider this impact before issuing any regulation that may lead to increased use of these chemicals.

Staff Response:

The CPSC staff's preliminary report on environmental effects in the October 2001 briefing package discussed air quality as well as other environmental outcomes associated with FR chemical use. The report acknowledged that incineration of certain FRs could produce toxic combustion products such as furans and dioxins. The potential impact on air quality (as well as water quality and other aspects of the human environment) is very small given the relatively small increases in the quantities of FRs that would be consumed in upholstery treatments and eventually subject to disposal (by incineration, in landfills or otherwise).

D. Human Factors Issues

Four commenters discussed the role of human behavior in fire safety. They generally recommended that CPSC rely on non-regulatory strategies, such as public education or better adult supervision of children, to address the risk associated with small open flame ignitions of upholstered furniture. A Human Factors Division (HF) memo addressing these comments appears at **Tab F**.

Comments:

Three commenters (Quaker, Weave, UFAC) stated their views that adult supervision and education in the home could effectively

reduce childplay fires. Two commenters (ATMI, Weave) recommended that CPSC evaluate the effectiveness of non-regulatory approaches, such as public education campaigns and smoke alarm programs, before considering rulemaking.

Staff Response:

The CPSC staff agrees that adult supervision and education of children in fire safety are necessary components of fire loss prevention. The staff considers these strategies to be much less effective at reducing deaths and injuries than ignition-resistant furniture would be. Children's innate curiosity and natural fascination with fire make it difficult to prevent childplay fires. Further, fire investigations have shown that children occasionally start fires while under adult supervision. In addition, careless behavior and indifferent attitudes toward fire safety are difficult to change with public education campaigns.

Smoke alarm usage has been demonstrated to reduce the risk of death in residential fires; many federal, state and local smoke alarm programs have been in place for years, and have contributed to the observed reduction in fire losses generally. Despite greatly increased smoke alarm use over the last 20 years, upholstered furniture fires remain a leading cause of residential fire deaths. The staff does not consider additional smoke alarm programs a sufficient means of addressing the risk, especially to young children.

E. Other Issues

Seven commenters mentioned some general issues in addition to the specific topic areas discussed above. These commenters raised some points that bear on how and whether the Commission should proceed with regulatory action on upholstered furniture.

Comments:

Six commenters (NSAFM, AFMA, UFAC, FRCA, Hoebel, Zoltek) discussed the need for a uniform national standard. They generally favored a CPSC rule on the basis that it would pre-empt conflicting state or local regulations (like California TB-117). Some recommended harmonizing with California or U.K. regulations to minimize market disruption and costs of compliance to industry and consumers. One commenter (NASFM) reiterated their intent to pursue legislative action by the Congress to require a national standard.

Staff Response:

The CPSC staff agrees that a national standard for upholstered furniture would cause less economic disruption than a series of

potentially conflicting state regulations. A CPSC rule would generally pre-empt any non-identical provisions of TB-117 or any other state regulation addressing the risk of small open flame ignitions of upholstered furniture.

The staff's draft standard is very similar in methodology and effect to the existing U.K. regulations, which are the most likely basis for any future EU standards. The staff continues to work cooperatively with the California BHF to maximize harmonization between the staff's draft standard and the draft revised TB-117. As noted previously, the revisions to TB-117 are substantial, and may be similar to the CPSC staff's draft standard in terms of expected product modifications and increased consumer safety.

Comments:

Three commenters (UFAC, Weave, Quaker) contended that "fire-safe" cigarettes would be the best way to address the cigarette fire risk; one commenter (Weave) stated that the small open flame risk itself was too small to regulate.

Staff Response:

The staff agrees that "fire-safe" cigarettes with lower ignition propensity (IP) when dropped on upholstered furniture could deliver safety benefits to consumers much more quickly than flammability standards for the products involved in ignition. One manufacturer has already introduced lower-IP cigarettes using promising new paper technology; other manufacturers are expected to do so in 2003 to comply with expected regulations pursuant to the recent New York cigarette safety legislation.

This issue is important to CPSC because reductions in societal costs associated with cigarette fire losses comprise a majority of the projected benefits of the CPSC staff's draft small open flame standard. To the extent that lower-IP cigarettes effectively reduced upholstered furniture fire losses, the expected net benefits of a CPSC rule would decline.

Since lower-IP versions of most cigarettes are not yet available on the market, their likely effectiveness is unknown. Further, lower-IP cigarettes will not be marketed nationwide: Congressional attempts since the 1980s to pass standards-setting legislation have thus far been unsuccessful, and manufacturers have reported that they have geared up their production facilities to make both conventional and lower-IP cigarettes. Thus, the CPSC staff is unable to predict whether or when a significant decline in cigarette fire losses may be observed, either in New York or nationally. It is unlikely, however, that any such decline will be observed within the next two or three years, given the gradual

phase-in of the products and the lag time involved in obtaining state and national fire data. The staff intends to obtain and test New York cigarettes when they become available. The staff will then consider whether it may be necessary to adjust its estimates of net benefits associated with a possible CPSC standard.

Comments:

Two commenters (UFAC, American) recommended that CPSC establish a joint industry/government research effort to pursue basic research on new upholstery technologies and materials that would be effective and technically and economically feasible. The commenters asserted that this cooperative program could support the development of upholstered furniture products that would meet a possible federal standard and be acceptable to industry and consumers.

Staff Response:

The staff encourages voluntary action and industry-government cooperation in standards development. This cooperation has been ongoing during the staff's work to address the small open flame risk. Various industry groups have provided valuable technical assistance and expertise to the CPSC staff during the development of the staff's draft standard. The CPSC staff has conducted basic research and shared test data and other information with the ASTM voluntary small open flame work group formed in 1996, with the voluntary furniture intra-industry coalition formed in 2000, and with other interested parties.

Manufacturers of barriers and cover fabrics using innovative new technologies and fibers have submitted samples to CPSC for laboratory testing. Although some of these new products and materials are experimental or employ proprietary technologies, others have recently become available on the market, or are already in use in other applications.

The staff recognizes the importance of furniture manufacturers' and other stakeholders' involvement in the development of new-technology materials to serve the residential upholstery market. The staff will continue to encourage the various industry groups to share information on new-technology products; the staff will also support, with laboratory testing or other efforts, as appropriate, research on new-technology materials that could be used in upholstered furniture to increase the level of small open flame protection.

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III. Conclusions

The CPSC staff's June 2002 public meeting yielded valuable additional information on the issues outlined in the March 20, 2002 *Federal Register* notice soliciting comments. The staff is making revisions to its draft small open flame standard as a result of the comments, although the general approach of preventing ignition or limiting fire growth and measuring performance with relatively simple seating mockup tests is unchanged. The staff intends to retain the seating barrier option in the draft standard to afford flexibility to manufacturers, minimize reliance on upholstery cover fabrics and preserve construction and fabric choices for consumers.

The staff's conclusions in the 2001 package about the technical and economic feasibility of a small open flame standard remain basically unchanged. The staff continues to work with industry representatives, other government agencies, and other interested parties to refine the staff's draft small open flame standard and to coordinate non-CPSC activities related to upholstered furniture flammability. The planned refinements to the staff's draft small open flame standard as a result of the June 2002 public meeting comments are relatively minor. To follow the external developments that may affect the eventual outcome of the CPSC's proceeding, the staff will:

- cooperate with the California BHF and monitor their progress toward amending TB-117 to upgrade the level of safety that standard provides;
- work with EPA to develop a draft SNUR, to accompany a CPSC proposed rule or California BHF proposed amendments;
- monitor ongoing chemical industry studies on FRs for which data are still needed;
- work with industry groups to facilitate development and awareness of new-technology materials; and
- develop a plan to conduct furniture mockup tests with cigarettes that meet the upcoming New York requirements for reduced ignition propensity.

The staff intends to forward to the Commission an updated regulatory options package later this year. This package will contain the staff's revised draft standard and recommendations regarding alternatives to address fire risks associated with upholstered furniture.

List of Attachments

TAB A: CPSC Meeting Log, D. Ray: Upholstered Furniture, Public Meeting, June 18-19, 2002 (with attached March 20, 2002 *Federal Register* notice)

TAB B: Directorate for Engineering Sciences memorandum, Analysis of Upholstered Furniture Public Meeting Comments, R. Khanna, December 30, 2002

TAB C: Directorate for Laboratory Sciences memorandum, Response To Public Meeting Comments, L. Fansler, December 20, 2002

TAB D: Directorate for Economic Analysis memorandum, Upholstered Furniture Flammability: Analysis of Comments from the June 2002 Public Meeting, C. Smith, December 27, 2002

TAB E: Directorate for Health Sciences memorandum, Health Sciences Response to Public Comments on Upholstered Furniture, M. Babich, December 2, 2002.

Tab F: Directorate for Engineering Sciences memorandum, Human Factors Analysis of Upholstered Furniture Public Meeting Comments, C. Meiers, December 31, 2002.

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TAB A

CPSC PUBLIC MEETING LOG: UPHOLSTERED FURNITURE

Meeting Between: CPSC staff and interested members of the public

Date of Meeting: June 18-19, 2002

Meeting Site: CPSC Headquarters, East-West Towers, Bethesda, MD

Log Entry By: Dale R. Ray, Project Mgr., EC, (301) 504-0962 x1323

Participants: Acting Chairman Thomas H. Moore
Commissioner Mary S. Gall
Various CPSC staff members
About 100 outside attendees (see attached agenda / presentation roster and attendee list)

Summary:

This meeting was requested by the CPSC staff to discuss options for addressing upholstered furniture flammability. The focus of the discussion was the draft small open flame standard and supporting materials developed by the staff and presented in an October 2001 Commission briefing package (available on-line at www.cpsc.gov or through CPSC's Office of the Secretary). Presentations at the meeting also covered recent industry activities, technical data and innovations related to the small open flame performance of upholstered furniture. Nineteen representatives of government, fire safety and industry organizations presented information at the meeting. A videotape of the entire meeting and printed copies of each presentation (as well as additional written submissions not presented at the meeting) are also available from CPSC's Office of the Secretary.

After a brief welcome and summary of the agency's activities by Ms. Elder and Mr. Ray of the CPSC staff, the participants made oral presentations on their respective topics. The staff and Commissioners asked questions after each presentation. The staff invited any interested parties to submit additional comments or recommendations to CPSC by July 18, 2002.

The meeting participants discussed several aspects of the CPSC staff's draft standard, including technical and economic issues involving product and materials design, testing methods and compliance issues, costs and benefits, chemical safety and other points. Many expressed their opinions about the status of voluntary industry activities, ongoing work to develop a new standard in California, and how the Commission should proceed in the context of these other activities. Some favored Commission regulation; others opposed further CPSC action. The CPSC staff will review the extensive information presented at the meeting as the staff considers recommendations to the Commission on upholstered furniture flammability.

Attachments

UPHOLSTERED FURNITURE
PUBLIC MEETING JUNE 18-19, 2002

AGENDA

Tuesday, June 18

Morning session: 10:00 - 12:00

--Welcome & Opening Remarks: J. Elder, D. Ray
--National Ass'n. of State Fire Marshals: D. Bliss
--California Bureau of Home Furnishings: J. McCormack
--American Furniture Mfrs. Ass'n.: A. Counts
--Upholstered Furniture Action Council: J. Ziolkowski

Afternoon session: 2:00 - 4:00

--Alliance for the Polyurethanes Industry: K. Reimann, A. Grand
--National Cotton Council: P. Wakelyn
--Fire Retardant Chemicals Association: R. Rose
--Akzo-Nobel Chemical Co.: W. Gentit

Wednesday, June 19

Morning session: 9:00 - 12:00

--American Textile Mfrs. Ass'n.: P. Adair, H. Truslow
  -Quaker Fabrics of Fall River: D. Pettey
  -Weave, Inc.: R. Berkley
--Joan / Mastercraft Fabrics: L. Tomerlin
--Culp, Inc.: D. Bell

Afternoon session 1:00 - 3:00 (if necessary)

--McKinnon-Land Fabric Co.: F. Land
--INDA, Ass'n. of the Nonwovens Industry: C. Comelio
--Decorative Fabrics Ass'n.
  -Calico Corners, Inc.: J. Jessup
  -Kravet, Inc.: C. Kravet
  -Covington Industries, Inc.: R. Gilmartin

Regulatory Impact

Would This Proposed AD Impact Various Entities?

The regulations proposed herein would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, it is determined that this proposed rule would not have federalism implications under Executive Order 13132.

Would This Proposed AD Involve a Significant Rule or Regulatory Action?

For the reasons discussed above, I certify that this action (1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) if promulgated, will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. A copy of the draft regulatory evaluation prepared for this action has been placed in the Rules Docket. A copy of it may be obtained by contacting the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration proposes to amend part 39 of the Federal Aviation Regulations (14 CFR part 39) as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. FAA amends § 39.13 by adding a new airworthiness directive (AD) to read as follows:

Air Tractor, Inc.: Docket No. 2000–CE–76–AD.

(a) *What airplanes are affected by this AD?* This AD affects Model AT–802 and AT–802A airplanes, serial numbers 802–0001 through 802–0081, that are certificated in any category.

(b) *Who must comply with this AD?* Anyone who wishes to operate any of the airplanes identified in paragraph (a) of this AD must comply with this AD.

(c) *What problem does this AD address?* The actions specified by this AD are intended to prevent wear of the rudder control cables at the fairlead, which could cause the rudder control cable to break and result in loss of rudder control.

(d) *What actions must I accomplish to address this problem?* To address this problem, you must accomplish the following:

Actions	Compliance	Procedures
(1) Replace the rudder control cables and fairlead with part numbers 70524–10–500 or 70524–6–500, and 70122–1, as specified in the service letter.	Within the next 500 hours time-in-service (TIS) after the effective date of this AD, unless already accomplished.	Accomplish the replacements in accordance with Snow Engineering Company Service Letter # 199, dated May 30, 2000, and applicable drawing number 70523 of the replacement kit, as specified in the service letter.
(2) Do not install any rudder control cable that does not have a stainless steel sleeve crimped to the cable in the fairlead area.	Not Applicable	Not Applicable.

(e) *Can I comply with this AD in any other way?* You may use an alternative method of compliance or adjust the compliance time if:

(1) Your alternative method of compliance provides an equivalent level of safety; and

(2) The Manager, Fort Worth Airplane Certification Office (ACO), approves your alternative. Submit your request through an FAA Principal Maintenance Inspector, who may add comments and then send it to the Manager, Fort Worth ACO.

Note: This AD applies to each airplane identified in paragraph (a) of this AD, regardless of whether it has been modified, altered, or repaired in the area subject to the requirements of this AD. For airplanes that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and, if you have not eliminated the unsafe condition, specific actions you propose to address it.

(f) *Where can I get information about any already-approved alternative methods of compliance?* Contact Garry D. Sills, Aerospace Engineer, FAA, Fort Worth Airplane Certification Office, 2601 Meacham Boulevard, Fort Worth, Texas 76193–0150; telephone: (817) 222–5154; facsimile: (817) 222–5960.

(g) *What if I need to fly the airplane to another location to comply with this AD?* The FAA can issue a special flight permit under sections 21.197 and 21.199 of the Federal Aviation Regulations (14 CFR 21.197 and 21.199) to operate your airplane to a location where you can accomplish the requirements of this AD.

(h) *How do I get copies of the documents referenced in this AD?* You may get copies of the documents referenced in this AD from Air Tractor, Incorporated, P.O. Box 485, Olney, Texas 76374. You may view these documents at FAA, Central Region, Office of the Regional Counsel, 901 Locust, Room 506, Kansas City, Missouri 64106.

Issued in Kansas City, Missouri, on March 12, 2002.

Dorenda D. Baker,

Acting Manager, Small Airplane Directorate, Aircraft Certification Service.

[FR Doc. 02–6628 Filed 3–19–02; 8:45 am]

BILLING CODE 4910–13–P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Chapter II

Regulatory Options for Addressing Upholstered Furniture Flammability; Public Meeting

AGENCY: Consumer Product Safety Commission.

ACTION: Notice of public meeting and request for comments.

SUMMARY: The Consumer Product Safety Commission (CPSC or Commission) will conduct a public meeting June 18–19, 2002 to discuss options for addressing upholstered furniture flammability. The meeting is not a Commission hearing. The focus of the discussions will be the supporting information and draft upholstered furniture flammability standard developed by CPSC staff included in the October 30, 2001 briefing package entitled "Upholstered Furniture Flammability: Regulatory Options," the progress of outside groups in addressing the same problem, and recent developments in related

flammability issues.[1] The Commission invites written comments and oral presentations from individuals, associations, firms, and government agencies with information or comments related to the briefing package. The Commission will evaluate these submissions in its deliberations on the flammability hazards associated with upholstered furniture.

DATES: The meeting will begin at 10:00 a.m. on June 18, 2002, and continue on June 19, 2002. Requests to make oral presentations, and 10 copies of the text of the presentation, must be received by the CPSC Office of the Secretary no later than May 20, 2002. Persons making presentations at the meeting should provide an additional 50 copies for dissemination on the date of the meeting. Written submissions that are in place of, or in addition to oral presentations, must be received by the Office of the Secretary no later than July 18, 2002. Ten copies should be provided.

Presentation texts and other written submissions should identify the author's affiliation with, or employment or sponsorship by, any entity with an interest in the upholstered furniture proceeding. Any data, analyses or studies should include substantiation and citations. The Commission reserves the right to limit the number of persons who make presentations and the duration of their presentations.

ADDRESSES: The meeting will be in room 420 of the East-West Towers Building, 4330 East-West Highway, Bethesda, MD. Written comments, requests to make oral presentations, and texts of oral presentations should be captioned "Upholstered Furniture Flammability Proceeding" and mailed to the Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207, or delivered to that office, room 502, 4330 East-West Highway, Bethesda, Maryland 20814. Comments, requests, and texts of oral presentations may also be filed by facsimile to (301) 504–0127 or by e-mail to *cpsc-os@cpsc.gov*.

FOR FURTHER INFORMATION CONTACT: For information about the purpose or subject matter of this meeting contact Dale R. Ray, Project Manager, Directorate for Economic Analysis, U.S. Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 504–0962, extension 1323; fax (301) 504–0109; e-mail *dray@cpsc.gov*. For information about the schedule for submission of written comments, requests to make oral presentations, and submission of texts of oral presentations, contact Rockelle Hammond, Office of the Secretary, Consumer Product Safety Commission, Washington, DC 20207; telephone (301) 504–0800, extension 1232; fax (301) 504–0127; e-mail *rhammond@cpsc.gov*.

SUPPLEMENTARY INFORMATION:

A. Background

In 1994, the Commission initiated a regulatory proceeding to address the hazard of small open flame ignitions of upholstered furniture by publication of an advance notice of proposed rulemaking (ANPR). 59 FR 30735 (June 15, 1994). Small open flame sources include, for example, cigarette lighters, matches, and candles. The CPSC staff work indicates that a small open flame performance standard for upholstered furniture could reduce the risk of death, injury, and property loss.

Following issuance of the ANPR, CPSC staff developed a draft performance standard and a test method to evaluate the small open flame performance of upholstered furniture. In October 1997, the staff forwarded a briefing package to the Commission concluding that a small open flame standard was feasible and could effectively reduce the risks to consumers, including risks from both small open flame and cigarette ignitions. Since 1997, the staff has continued to develop the small open flame standard.

The standard that the staff has drafted contains performance requirements for small open flame ignition resistance of seating areas and dust covers of upholstered furniture. It also includes an optional seating barrier test that would allow the use of fire-retardant barriers, or interliners, instead of FR cover fabrics. The seating barrier test is intended to preserve consumer choice among many existing upholstery fabrics. CPSC staff believes that this would give manufacturers flexibility in achieving compliance, and would reduce the potential economic burden of the performance standard, especially for small businesses.

In the 1997 briefing package, the staff recommended that the CPSC gather additional scientific information to ensure that flame retardant (FR) upholstery fabric treatments that manufacturers might use would not result in adverse health effects. In 1998, the Commission held a public hearing on FR chemical issues. Representatives of government, industry, fire safety organizations, and other interested parties testified at the May 5–6, 1998 public hearing, or submitted information about FR chemicals following the hearing. The staff incorporated the information submitted pursuant to the public hearing and all other available scientific data into the FR chemical risk assessment in the October 30, 2001 briefing package. That assessment concluded that four of the eight FR chemicals selected for risk assessment would clearly not be considered hazardous to consumers under the Federal Hazardous Substances Act (FHSA). The assessment also identified one chemical as unlikely to be hazardous, one as hazardous, and two for which additional data were needed.

In the CPSC Fiscal Year 1999 appropriation bill, Congress directed the Commission to sponsor an independent study by the National Academy of Sciences (NAS) of potential health risks from FR chemicals that might be used to meet a flammability standard. The final NAS report was published in July 2000. The NAS study concluded that 8 of the 16 FR chemicals reviewed would present a minimal risk, even under "worst case" exposure assumptions. The NAS recommended further study for the remaining 8 chemicals.

B. The Public Meeting

The purpose of the public meeting is to provide a forum for dialog between Commission staff and interested parties on the work performed to date by the staff in developing a draft small open flame ignition standard for upholstered furniture, the related information developed during that effort, the progress of efforts by outside organizations to address the risk, and recent developments in related flammability issues. The meeting is not a Commission hearing.

Participation in the meeting is open. The CPSC staff will notify specific representatives of identified interest groups such as industry sectors (furniture, fabrics, foam, chemicals), fire safety and government (national, state/local, international), and consumer interests of the meeting. The meeting will be conducted in an open discussion format. Participants may be organized into panels to address specific topics. See the **DATES** section of this notice for information on making requests to give oral presentations at the meeting and on making written submissions.

[1] Briefing memorandum from Dale R. Ray, Project Manager, Directorate for Economic Analysis, to the Commission, "Upholstered Furniture Flammability: Regulatory Options," October 30, 2001. The document may be obtained from the CPSC web site at www.cpsc.gov or from the CPSC Office of the Secretary. The document is also available for inspection at the Commission's Public Reading Room, 4330 East-West Highway, room 419, Bethesda, Maryland 20814. For further information call the Office of the Secretary at (301) 504–0800.

C. Meeting Topics

To assist interested parties in deciding on whether and how to participate in the public meeting, or to submit written comments on the staff briefing package, the Commission is providing the following list of topics.

- Fire data & analysis
- Standards development & laboratory testing
- The CPSC staff's draft small open flame standard
- FR chemical testing, analysis & risk assessment
- Economic analysis
- Other standards/harmonization
  - —California TB–117
  - —United Kingdom regulations
  - —Voluntary standards activities
- Industry efforts to develop safer products & materials
- Regulatory alternatives

As indications of interest in making presentations and otherwise participating in the meeting are received, the Commission will revise and update the list of topics.

Dated: March 14, 2002.

Todd A. Stevenson,

Secretary, Consumer Product Safety Commission.

[FR Doc. 02–6633 Filed 3–19–02; 8:45 am]

BILLING CODE 6355–01–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 101

[Docket No. 01N–0458]

RIN 0910–AA19

Food Labeling; Guidelines for Voluntary Nutrition Labeling of Raw Fruits, Vegetables, and Fish; Identification of the 20 Most Frequently Consumed Raw Fruits, Vegetables, and Fish

AGENCY: Food and Drug Administration, HHS.

ACTION: Proposed rule.

SUMMARY: The Food and Drug Administration (FDA) is proposing to amend the voluntary nutrition labeling regulations by updating the names and the nutrition labeling values for the 20 most frequently consumed raw fruits, vegetables, and fish in the United States. We are taking this action because current regulations require the agency to publish proposed updates (or a notice that the data sets have not changed from the previous publication) at least every 4 years. We also propose to revise the guidelines for the voluntary nutrition labeling of raw fruits, vegetables, and fish to make necessary changes resulting from the updated nutrition information and to provide further clarification of the guidelines. Availability of the updated nutrition labeling values in retail stores and on individually packaged raw produce and fish will enable consumers to make better purchasing decisions to meet their dietary needs.

DATES: Submit written or electronic comments on this proposal by June 3, 2002. See section IX of this document for the proposed effective date of a final rule based on this document.

ADDRESSES: Submit written comments to the Dockets Management Branch (HFA–305), Food and Drug Administration, 5630 Fishers Lane, rm. 1061, Rockville, MD 20852. Submit electronic comments to http://www.fda.gov/dockets/ecomments.

FOR FURTHER INFORMATION CONTACT: Lori LeGault, Center for Food Safety and Applied Nutrition (HFS–840), Food and Drug Administration, 5100 Paint Branch Pkwy., College Park, MD 20740, 301–436–1791, or e-mail: LLegault@cfsan.fda.gov.

SUPPLEMENTARY INFORMATION:

I. Background

In response to requirements of the Nutrition Labeling and Education Act of 1990 (the 1990 amendments) (Public Law 101–135), which amended the Federal Food, Drug, and Cosmetic Act (the act), we published final regulations in the **Federal Register** of November 27, 1991 (56 FR 60880) (the 1991 final rule), and corrections in the **Federal Registers** of March 6, 1992 (57 FR 8174), and March 26, 1992 (57 FR 10522) that: (1) Identified the 20 most frequently consumed raw fruits, vegetables, and fish in the United States, which are those varieties purchased raw but not necessarily consumed raw; (2) established guidelines for the voluntary nutrition labeling of these foods; and (3) set the criteria for food retailers to meet substantial compliance with these guidelines. The 1991 final rule also required us to publish proposed updates of the nutrition labeling data for the 20 most frequently consumed raw fruits, vegetables, and fish (or a notice that the data sets have not changed) at least every 2 years (56 FR 60880 at 60888 and 60891).

Next, we published a proposed rule on the voluntary nutrition labeling program in the **Federal Register** of July 18, 1994 (59 FR 36379) (the 1994 proposed rule), and a correction in the **Federal Register** of July 21, 1994 (59 FR 37190). The 1994 proposed rule proposed to: (1) Update the nutrition labeling values for the 20 most frequently consumed raw fruits, vegetables, and fish in the United States; and (2) revise the guidelines for the voluntary nutrition labeling of these foods to reflect the 1993 mandatory nutrition labeling final rules.

Finally, in the **Federal Register** of August 16, 1996 (61 FR 42742), we published a final rule entitled "Food Labeling; Guidelines for Voluntary Nutrition Labeling of Raw Fruits, Vegetables, and Fish; Identification of the 20 Most Frequently Consumed; and Policy for Data Base Review for Voluntary and Mandatory Nutrition Labeling" (the 1996 final rule). In the 1996 final rule, among other actions, we revised: (1) The nutrition labeling values for the 20 most frequently consumed raw fruits, vegetables, and fish in the United States, and (2) the guidelines for the voluntary nutrition labeling of these foods. We also modified the guidelines in § 101.45(b) (21 CFR 101.45(b)), in response to comments, to state that we would publish every 4 years (rather than 2 years) proposed updates of the nutrition data or a notice that the data sets have not changed from the previous publication (comment 12, 61 FR 42742 at 42746 and 42760).

We are now proposing to update the listing of the 20 most frequently consumed raw fruits, vegetables, and fish and their nutrition labeling values based on new data submitted or made available to the agency. This will enable consumers to have more accurate and up-to-date nutrition information for these foods.

II. Guidelines for Presentation of the Nutrition Labeling Values

A. Background and Proposed Revisions

To provide clarity and consistency in the voluntary nutrition labeling of raw fruits, vegetables, and fish, we propose to: (1) Divide current § 101.45(a)(3)(iii) into two parts (i.e., into §§ 101.45(a)(3)(iii) and 101.45(a)(3)(iv)) so that § 101.45(a)(3)(iii) pertains only to raw fruits and vegetables and § 101.45(a)(3)(iv) pertains only to raw fish, and (2) revise the wording for consistency and increased readability. In § 101.45(a)(3)(iii), we also propose to change the portion of the footnote about the saturated fat content of avocados from "* * * avocados provide 1 gram (g) of saturated fat per ounce (oz)" to "* * * avocados provide 0.5 g of saturated fat per oz." This decrease in saturated fat content is based on the most recent

TAB B

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: December 30, 2002

TO : Dale Ray
Project Manager, Upholstered Furniture
Economic Analysis

THROUGH: Margaret Neily
Acting Division Director, Combustion and Fire Sciences
Directorate for Engineering Sciences

Hugh McLaurin
Associate Executive Director
Directorate for Engineering Sciences

FROM : Rohit Khanna
Project Engineer, Combustion and Fire Sciences
Directorate for Engineering Sciences

SUBJECT : Analysis of Upholstered Furniture Public Meeting Comments

This memorandum presents Engineering Sciences (ES) staff response to relevant public comments received during the Upholstered Furniture Public Meeting, June 18 – 19, 2002. In cases where there are opposing comments on a common issue, the response is combined to describe Engineering Sciences position on the matter.

USE OF BARRIERS

The following comments relate to the efficacy of barriers in upholstered furniture. Most of the comments support the use of barriers.

Comment: *"Barriers are effective in a system but not sufficient alone.."*
National Association of State Fire Marshals (NASFM)

Comment: *"Prefer composite test that does not rely so heavily on cover fabrics, but support barrier component alternative."*
American Textile Manufacturers Association (ATMI)

Comment: *"Support barrier alternative."*
Polyurethane Foam Association (PFA)

Comment: *"Support barrier alternative, provides adequate safety."*
Wellman

Comment: *"Barrier increases escape time, offers adequate protection."*
Association of the Nonwovens Industry (INDA)

Comment: *"Support barrier alternative; even though furniture would not always self-extinguish, it would allow more escape time."*
Zoltek

Response: Throughout the standard development process, CPSC staff has recognized the need to explore alternate performance requirements. The application of current flame retardant technologies required to meet the draft standard may change the material properties of some upholstered furniture textiles such that it is no longer feasible to continue their use. For these fabrics, the use of fire barriers is an approach that can provide an improved level of protection from the risk of small open flame ignition. Fire barrier materials can offer increased design options for achieving acceptable fire performance. Fire barriers have been studied as a means of reducing cigarette ignitability, open flame ignitability, and fire growth.

Although the CPSC staff preference is to prevent ignition of furniture, the barrier approach can be effective in reducing the hazard of upholstered furniture fires when applied with appropriate performance requirements. Some barriers can provide improved flammability performance against open flame sources. The draft standard requires that barriers prevent ignition of the interior filling materials of furniture, which would reduce the severity of upholstered furniture fires and allow more escape time for occupants. The staff believes that allowing an alternate barrier test approach with a larger ignition source, representing burning upholstery fabric, could provide a reasonable level of protection from small open flame ignition of furniture and provide flexibility to upholstered furniture manufacturers.

COMPONENT REQUIREMENTS:FOAM FILLING MATERIALS/FABRICS

The following comments relate to foam filling materials. Most of the comments request the adoption of specific requirements for foam.

Comment: *"Standard should include requirements for filling materials."*
NASFM

Comment: *"Consider possible provision for foam filling materials."*
American Furniture Manufacturers Association (AFMA)

Comment: *"Draft standard does not address the risk from foam filling materials."*
Flame Retardant Chemical Association (FRCA)

Comment: *"Draft standard does not address foam risk."*
Quaker

Comment: *"Consider always requiring FR fabrics, over either barriers or foam."*
FRCA

Response: For upholstered furniture fires ignited by a small open flame source, the staff believes that ignition behavior is the most effective parameter to use as a basis for setting a flammability standard. The ignition sources (matches, candles, cigarette lighters) typical of these fires are relatively small. The staff has demonstrated both economic and technical feasibility to produce upholstered furniture that will resist ignition from small open flames. The performance requirements in the draft standard do not provide design specifications for upholstered furniture components because they can be unduly restrictive. There are several methods available to furniture producers to meet the draft standard, including flame-retardant chemicals for fabric and filling materials such as foam, and barriers/interliners. When a manufacturer can produce furniture that meets the performance requirements of the draft standard, the staff believes that additional requirements for specific components are unnecessary.

REVISED CALIFORNIA TECHNICAL BULLETIN 117 (TB-117)

The following comments deal with the revised California Technical Bulletin 117. Some comments describe the revised TB-117 as a more effective approach, while others believe the contrary.

Comment: *"Revised TB-117 uses a more effective approach."*
NASFM

Comment: *"Revised TB-117 contains redundant safety requirements for filling materials to provide maximum escape time, assure adequate safety."*
California Bureau of Home Furnishings (CBHF)

Comment: *"Standard should harmonize with revised TB-117."*
INDA

Comment: *"Revised TB-117 not correlated to full-scale tests; CPSC should not adopt."*
Upholstered Furniture Action Council (UFAC)

Response: The revised TB-117 contains significant improvements in flammability requirements from its previous version. Notably, the upgraded flame-resistance test for upholstery fabrics, the horizontal small-flame test for natural/synthetic and bleached fibers over standard cotton sheeting, and the inclusion of a composite test and dust cover test demonstrate a significant shift in test methodology. The staff still has concerns about the component test procedures that remain in TB-117. The revised TB-117 is similar to the CPSC draft standard in terms of the ignition source and flame exposure time. The major difference between the CPSC test and the revised TB-117 is the requirement for use of TB-117 FR foam. The CPSC staff supports the adoption of performance requirements that give manufacturers maximum flexibility in achieving small open flame ignition performance rather than design specifications for furniture components. In addition, there is no data supporting the correlation of the revised TB-117 standard to the performance of full-scale furniture.

MASS LOSS RATE

The following comments deal with the application of mass loss rate as an acceptance criterion in a standard. Some comments support mass loss rate measurement, while others indicate that mass loss rate does not provide a good measure of fire hazard.

Comment: *"TB-117 incorporates mass loss rate acceptance criteria.*
CBHF

Comment: *"Recommend mass loss rate acceptance criteria (see Omega Point report)."*
Association of the Plastics Industry (API)

Comment: *"Recommend no maximum weight loss criteria; heavier weight fabrics may fail without posing any greater fire hazard."*
Wellman

Response: The staff investigated several approaches in its standard development process to address the risk of small open flame initiated upholstered furniture fires. Most flammability standards attempt to reduce fire risk by limiting combustion parameters such as heat release rate (HRR)/mass loss, flame-spread, or ignition behavior. The relative safety provided by controlling these parameters depends on the specific fire scenario that needs to be addressed. For some fire scenarios, controlling one combustion parameter may be more effective than another. It is important to recognize that the level of protection provided by a safety standard is closely tied to the test method used to evaluate fire performance.

Controlling the Heat Release Rate (HRR)/Mass Loss Rate (MLR) was an approach considered by staff. HRR standards are appropriate for fire scenarios where ignition sources are large and/or ignition of the product cannot be prevented. The alternative then is to control fire growth and to reduce the possibility of flashover. This approach is ideal for large public occupancies such as movie theaters, hotel lobbies, etc. where slowing fire growth is essential to provide tenable conditions for safe egress of occupants. The state of California has adopted a standard[1] that uses this approach. Typically these fire scenarios involve larger ignition sources, equivalent to a wastebasket fire, and ignition due to arson or incendiary acts. These ignition sources are not within the scope of the hazard the staff is attempting to address.

Controlling HRR/MLR of the furniture does not seem to be the most effective approach for a residential fire scenario. The toxic gases still present a significant threat to occupants in these fires, and preventing the ignition of furniture is possible. In addition, the correlation between bench-scale and full-scale performance has not been established for MLR.

[1] State of California Technical Bulletin 133, Flammability Test Procedure for Seating Furniture for Use in Public Occupancies.

ALTERNATE BARRIER TEST IGNITION SOURCE: CRIB #5

The following comments deal with the ignition source used in the Alternate Barrier Test of the draft standard.

Comment: *"Consider alternatives to Crib #5 ignition source (too stringent)."*
AFMA

Comment: *"Crib #5 more stringent than small flame ignition source; recommend applying small flame in both tests."*
Wellman

Response: The CPSC staff incorporated a barrier test to address the need for an alternate test method. The barrier test is based on the British Standards Institute 5852 standard[2] using the Crib #5 ignition source. The purpose of the barrier test is to limit the fire growth of the furniture composite. The test evaluates the ability of the barrier material to protect the internal filling of the furniture composite, while allowing the use of upholstery fabrics that cannot be successfully flame retarded.

Since the barrier material is not designed to prevent furniture ignitions, the ability of the barrier material cannot be adequately evaluated with a small open-flame ignition source. The performance of the barrier is critical when the furniture has already achieved a sustained ignition. Therefore, the ignition source in the barrier test should represent the heat that can be generated by burning of an upholstery fabric. The ignition source selected for the barrier tests is a 40 x 40-mm wooden crib with a mass of approximately 17 grams. The staff is looking at alternate configurations to Crib #5 to assure appropriate correlation to burning fabric, and will revise the ignition source in the draft standard, if needed.

COMPONENT/COMPOSITE TESTING

The following comments deal with component/composite testing.

Comment: *"Favor true composite test as most effective and measurable."*
API

Comment: *"Prefer composite test that does not rely so heavily on cover fabrics."*
ATMI

The staff agrees that composite testing more accurately predicts the performance of actual furniture than component testing. The shortcomings in the component test approach were clearly evident from a CPSC staff study of full-scale behavior of upholstered furniture, in which furniture meeting current TB-117 component requirements did not perform appreciably better in full-scale tests than conventional furniture. CPSC staff's draft standard utilizes a mock-up composite. The test can be considered a modified component approach, in that the test evaluates

[2] Methods of Test for Assessment of the Ignitability of Upholstered Seating by Smoldering and Flaming Ignition Sources – BS 5852: 1990

the ignition resistance of the cover fabrics and any barriers used in actual finished item construction in combination with a standard filling material. CPSC staff tests[3] demonstrated that the properties of actual filling materials have little effect on ignition resistance in full-scale chairs. The contribution of filling materials in furniture ignition by small open flames can be averted by improving the ignition resistance of the cover fabrics or by encapsulating the filling materials with an acceptable barrier. The standard also includes provisions to allow manufacturers to test a true composite mockup using the actual filling materials used in construction of the upholstered item.

Comment: *"Aim should be to prevent major fires, not all fires...".*
NASFM

Response: The staff agrees that the prevention of all upholstered furniture fires is not a realistic goal. The draft standard does not address ignition of furniture by large open flames or arson/incendiary acts. The majority of small open-flame upholstered furniture fires result from accidental ignition or childplay. The Commission has directed staff to develop a standard to address this specific risk.

Comment: *"Consider standard fabric for barrier test, or standard fabric classes."*
API

Response: The purpose of the Alternate Barrier Test is to evaluate the performance of a barrier's ability to protect the interior materials (foam and other filling components). The Crib #5 ignition source used in the test method is intended to represent a heat source that would simulate the effect of a burning cover fabric. The Crib #5 ignition source eliminates the need to include a standard cover fabric in the construction of the mockup. A fabric classification scheme would be difficult to develop due to the variety of upholstery fabrics available in the market. During the development of the Alternate Barrier Test, the staff evaluated the inclusion of cover fabrics and whether a fabric classification scheme could be reliably developed in barrier testing[4]. The results indicated that such a classification scheme would be difficult to develop due to the inconsistent performance of fabrics with similar fiber content.

Comment: *"CPSC draft standard is more stringent than TB-133."*
API

Response: The CPSC staff disagrees that the draft standard is too severe, compared to TB-133. TB-133 is a completely different standard than the draft CPSC staff standard. TB-133 addresses the risk of upholstered furniture fire from large open-flame sources and has different performance requirements. The criticism that furniture that passes TB-133 but fails the CPSC draft standard is invalid, since the objectives of the two standards and the performance

[3] Upholstered Furniture Flammability Testing: Full Scale Open Flame Data Analysis, L. Fansler, February 26, 1996
[4] Memorandum to Dale Ray, Project Manager, Upholstered Furniture, from L. Fansler, Division of Electrical Engineering, "Alternate Barrier Tests", October 23, 2001.

requirements are completely different. The TB-133 standard addresses a hazard more likely to occur in institutional scenarios.

Comment: *"Some cotton FR treatments can adversely affect cigarette ignitability; ATMI study identified some UFAC Class I fabrics that became Class II upon FR treatment."*
National Cotton Council (NCC)

Response: The provisions in the draft standard address the risk of small open flame ignition of upholstered furniture. In addition, substantial benefits will be achieved by reducing the risk of cigarette ignition. Upholstered furniture is capable of both flaming and smoldering combustion. The staff recognizes that these are two different physical combustion phenomena and has considered this in the development of the draft standard. The draft standard contains provisions to limit both flaming and smoldering combustion and based on testing, the draft standard would be effective in addressing flaming and smoldering combustion of upholstered furniture. Although the standard does not utilize a smoldering ignition source, the provisions account for smoldering combustion. A material's propensity to smolder is dependent on the physical and chemical properties of the material regardless of the ignition source. Staff testing of FR back-coated fabrics has demonstrated that this can be an effective method of improving both open flame and smoldering ignition of upholstered furniture[5].

Comment: *"Recommend 15 sec. flame exposure time to harmonize with Euro standards."*
(NCC)

Response: Although typical small open-flame ignition sources may be capable of burning longer than 20 seconds, the behavior expected in child play and other inadvertent or accidental scenarios indicate that a 20 second flame exposure time is reasonable for the draft standard. In addition, testing of upholstery fabrics shows that 20 seconds represents a good ignition threshold in fabric performance[6]. This distinguishes between fabrics that will and will not ignite from a small flame ignition source. The flame exposure time in the draft standard relates to the flame exposure consistent in residential fire scenarios. Reducing the flame exposure time to harmonize with European standards would diminish the draft standard's effectiveness.

Comment: *"Draft standard does not address risk of large open flame fires."*
FRCA

Response: The scope of the draft standard is limited to the risk of small open-flame ignition of upholstered furniture. The draft standard does not address risk of furniture ignited by large open flame sources. The Commission denied that part of the original petition by the NASFM.

Comment: *"Support composite test that better correlates with full-scale."*
PFA

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[5] Fansler, Linda, *UK and Mock-Up Chair Results*, Directorate for Laboratory Sciences, CPSC, Gaithersburg, MD (October 2000)
[6] Memorandum from Linda Fansler to Dale Ray, "Summary of Upholstered Furniture Tests", September 19, 1997.

Response: To support the development of the test method, staff conducted full-scale tests on actual finished items of upholstered furniture, including tests on furniture purchased from the U.K. made with FR-treated fabrics. The results of the full-scale tests were compared with the corresponding bench-scale tests for each chair tested in full-scale in a correlation study[7]. The correlation between full scale and mockup test results was reasonably good ($\tau = .68$), with no significant difference between mean passing ratios at the 95% confidence level. This correlation exists even with apparent anomalies in 5 of 27 samples. Among all products tested by the staff, full scale and mockup ignition performance was the same in a substantial majority of tests. (It should be noted that, even among the small number of inconsistent results, the FR-treated chairs exhibited much less hazardous ignition behavior than that of conventional chairs made with non-FR fabrics.).

Comment: *"U.K. experience shows CPSC draft standard would be effective."*
James Hoebel

Response: CPSC staff testing of upholstered furniture built to U.K. regulations has shown improved flammability performance compared to conventional upholstered furniture. The staff believes that the technologies used to meet U.K. fire safety regulations can be successfully applied in the United States to meet the CPSC staff's draft standard.

DEFINITIONS IN THE DRAFT STANDARD

The following comments from, all from API, concern definitions in the draft standard.

Comment: *"We have some concerns about several of the definitions cited in this standard. Some of the definitions do not seem "user friendly", when one considers the public at large. For example, the definition of flaming is combustion in the gaseous phase with the emission of light. Not only does the general public not appreciate the gaseous nature of combustion, they may not care. A possible alternate definition might be as follows: "combustion with visible flame. Heat and smoke are generally produced."*

Response: The technical nature of the CPSC staff's draft standard may result in the use of terms that are not familiar to the general public. The definition of "flaming" in the draft standard is technically accurate and will be readily understood by testing labs, the upholstered furniture industry, and other users of the draft standard . The proposed language proposed by the API adds no more clarification for the general public.

Comment: *"The term "progressive smoldering" is puzzling. Smoldering, by definition, is "progressive." The usage in this document seems to suggest that progressive smoldering is smoldering that transitions to flaming or progressive smoldering that exceeds certain limits. Perhaps it should be stated that way, rather than using "progressive smoldering ignition". Also, "smoldering" combustion could include glowing, something excluded by the present definition; and does not necessarily evolve visible smoke, something required by the definition. Certainly, glowing is often absent and smoke usually produced, but smoldering could proceed at such a slow rate that these would be almost invisible.*

[7] UK Chairs, Full Scale-Mock-Up Relationship, L. Fansler, June 29, 2000

Response: The staff does not agree with API, that smoldering, by definition is "progressive". There is a distinction between smoldering that occurs independent of an ignition source (progressive) and smoldering that occurs only in the presence of the ignition source and stops after the source is removed. The staff agrees with API that smoldering could include glowing, and will revise the definition in the standard.

Comment: *"Sect. 4.2.1 and 4.2.2 – The terms "progressive smoldering ignition" and "flaming ignition", as used in this standard, require some additional consideration, both in their definitions (see above) and in their usage. First of all, "smoldering" and "ignition" could be thought of as two different things. Smoldering generally connotes combustion in the absence of flame, while ignition suggests flaming. Smoldering can lead to "ignition", which, is "flaming." This terminology must be critically reviewed before the final document is approved."*

Response: The terms defined in the draft standard attempt to clarify the performance requirements. The staff disagrees that ignition suggests flaming. Smoldering ignition can occur without the presence of flames. The draft standard defines ignition as "initiation of combustion, by the presence of any visible flaming, glowing, or smoldering after removal of the test flame." Ignition can occur via flaming or smoldering. The staff recognizes that smoldering and flaming are different modes of combustion that can occur with upholstered furniture and both modes must be equally addressed.

Comment: *"There is an inconsistency in parts "c" and "d" of 4.2.1 and "d" and "e" in 4.2.2. In each case, the first part refers to a period of time "after removal of the burner tube" (15 min. in 4.2.1(c); and 2 min. in 4.2.2(d). This implies that the timing of the test does not begin until removal of the burner tube. We believe that the test should start upon application of the burner tube, in a similar manner to what is instructed in the second "part", in each case. The reference there is to a period of time "after ignition of the crib" (60 min. in 4.2.1(c); and 10 min. in 4.2.2(d)). This suggests that the "test begins" upon ignition of the crib (i.e., upon introduction of the ignition source).*

Response: It is important to understand that the sections cited by the API refer to performance requirement for different tests. The Seating Area and Dust Cover Tests utilize a burner tube to provide a small open-flame test flame for 20 seconds on the specimens. It is important to control flame impingement and measure performance of the test specimens after removal of the burner tube. The Alternate Barrier Test utilizes a Crib #5 ignition source to evaluate barrier performance. Due to the nature of the barrier test and the Crib #5 ignition source, it is not practical to remove the crib once the test begins.

Comment: *"Sect. 4.2.1(c)- The instruction suggests that smoldering before 15 minutes following application of the burner tube is acceptable, as long as smoldering stops before 15 minutes and does not meet any of the criteria for failure. Apparently, smoldering is permitted as long as it stops at some point. We question whether that is true to the intent of the standard."*

Response: Yes, smoldering can occur, provided it stops within 15 minutes of burner tube removal and the specimen does not exhibit any other failure criteria. The objective of this

performance requirement is to limit allowable smoldering to 15 minutes. Smoldering that continues beyond 15 minutes has the potential to transition to flaming or can produce enough toxic gases to threaten occupants.

Comment: *"Similarly, it is permitted for a specimen to ignite and burn during and following the removal of the burner tube, as long as it goes out within 2 minutes of removal of the tube and does not meet any other failure criteria. Again, we question whether that is the intent of this standard."*

Response: Yes, flaming can occur, provided it stops within 2 minutes of burner tube removal and the specimen does not exhibit any other failure criteria. The objective of this performance requirement is to limiting flaming combustion to 2 minutes to limit fire growth and prevent full involvement of upholstered furniture.

Comment: *"Sect. 5.2 (water soak procedure) – We understand the need to soak a fabric in water to remove non-durable FR treatments. However, the phrase "thoroughly air dried" (Sect. 5.2.3) is insufficiently detailed. If a fabric were not adequately dried for 24 hours in a constant temperature/constant humidity environment, it would not be enough to bring it to equilibrium. Addition of some recommendations for drying could include use of portable hair dryer, wrapping the fabric in dry toweling, or instructions on the amount of time hanging on a rack under normal temperature and humidity conditions."*

Response: Specimens that are subject to the Water Soak Procedure are required to be conditioned for at least 24 hours in a constant temperature (temperature: 25 ± 4° C) and humidity (40 - 55 %) environment after water soaking. The staff agrees that more details on drying specimens prior to conditioning are needed and will revise this aspect of the draft standard.

Comment: *"Sect. 6.3.1 – Similar to section 5.2.3, the instruction in 6.3.1(a) is not sufficiently detailed. The "warm, dry" conditions for conditioning the wood must be spelled out. In ASTM E84, for example, the standard wood planks must be conditioned under a rigidly controlled atmosphere to reach specified moisture content.*

Response: The staff's testing using Crib # 5 indicates consistent burning behavior. The staff will assess the need to specify details for wood conditioning.

Comment: *"Section 8.6 - While "propan-2-ol" is the technical term, the general public would appreciate knowing that it is "isopropanol". The purity should be specified."*

Response: The term will be added to the definitions and will specify High Performance Liquid Chromatography (HPLC) grade.

Comment: *"Section 9.2 – The description of the fabric "cut-outs" in this section (5th paragraph) indicate that they are "triangular", whereas the figure shows them as truncated triangles (or rhomboids). Certainly, the triangular shape is easier to cut and there seems to be no good reason not to cut triangles. The text and the figure should agree with one another."*

Response: The text in the draft standard is consistent with the language used in the BS 5852 standard. The text gives a general description of the cut-outs and it is clear from the diagram in the draft standard the actual shape of the cut-outs. Users of the draft standard will readily understand the instructions.

Comment: *"Section 10.1 – Several portions of the instructions for preparation of the test specimens are not clear. In Section 10.1, it not obvious which way the fabric should be inserted into the frame (i.e., topside of the fabric up or down). In Section 10.4., it is unclear what is meant by "position the smaller dimension of fabric". In that same paragraph, the instruction "wrap both pieces of fabric or barrier material around the entire contour of seat foam" is unclear and misleading (isn't there just one piece of fabric?). Following that instruction, "insert larger foam", does not make sense."*

Response: The staff will revise the text in the standard to clarify the assembly of the test specimens.

Comment: *"Section 11.2 – If the pressure and flow rate are correct, the flame height should be 35 mm. The instruction "Ensure the flame height is approximately 35 mm" sounds as though the flame height is the determining factor. The instruction should probably read "Verify that the flame height is approximately 35 mm." If it is not, the setup should be re-examined why."*

Response: The combination of flame height and mass flow rate of butane is equally important. The standard provides guidance on how this can be accomplished and ways to address these anomalies.

Comment: *"Sect. 11.6 – The instruction appears to be missing some information: on comparison to 12.6, it looks like the word "record" is missing. Apparently, one should record "non-ignition" in the absence of flaming or progressive smoldering, unless the post-test observation reveals hidden smoldering.*

Response: The draft standard will be revised to correct the text.

Comment: *"Sect. 14 – There is a contradiction between this section and the definition of "smoldering". The text reads, "As cases of progressive smoldering can be undetectable", but the current definition of smoldering requires smoke evolution. This issue should be clarified.*

Response: Section 14 attempts to address situations where smoldering may be present in a test specimen that has penetrated to the interior of the test specimen. To ensure there is no smoldering present in the test specimen, the test operator must dismantle the specimen and check for progressive smoldering. Smoldering can be present and smoke can be produced that is not readily detectable from the outside of test specimens.

TAB C

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: December 20, 2002

TO : Dale Ray, Project Manager, Upholstered Furniture
Directorate for Economic Analysis

THROUGH: Andrew G. Stadnik, P.E., Associate Executive Director for Laboratory Sciences
Edward W. Krawiec, Director, Division of Electrical Engineering

FROM : Linda Fansler, Division of Electrical Engineering LF

SUBJECT : Response to Public Meeting Comments

This memorandum presents Laboratory Sciences staff responses to comments received as a result of the Public Meeting held to discuss upholstered furniture flammability. The meeting was held on June 18 and 19, 2002, at the Consumer Product Safety Commission (CPSC) headquarters in Bethesda, Maryland.

Crib No. 5 Is Too Stringent and Barrier Effectiveness

Three commenters indicated some concerns with the use of crib no. 5, and/or how barrier effectiveness is quantified between the crib no. 5 test and testing with a cover fabric. The three related comments are:

> **Comment:** "In a further effort to qualify the widest range of acceptable barrier materials, ... should assess the appropriateness of the crib 5 ignition test proposed by CPSC. The crib 5 test is a relatively severe test which British authorities reportedly chose in order to simulate arson incidents." – The American Furniture Manufacturers Association
>
> **Comment:** "... the British Standard 5852 Crib #5 appears to be excessive with respect to calorific output. ... it is not clear to Wellman why the Alternative Barrier Test seems more rigorous than the Seating Area Test." – Wellman, Inc.
>
> **Comment:** "We have seen test evidence in API member laboratories in which use of an approved barrier with certain heavier weight fabrics results in breaching of the barrier and full fire involvement of the foam in less than about 5 min. time." – Alliance For The Polyurethanes Industry (API)
>
> **Response:** The crib no. 5 test was added in 2001 as an alternative to the small open flame seating area test in the draft *Upholstered Furniture Standard* based in part on comments from the fabric industry. In the alternate test, the barrier is exposed to the burning wood crib, and the ability of the barrier to prevent continued fire growth is measured. During the

development of the alternate seating barrier test in 2001, CPSC's Laboratory Sciences staff conducted tests using several barriers and eight different upholstery or cover fabrics. Initial testing indicated that fire-blocking barriers could provide protection to the foam filling material below. The staff concluded that the crib no. 5 test adequately evaluated a barrier's performance when compared to the small open flame test applied to a variety of upholstery fabrics covering the barrier.[1]

Since that time, the CPSC Laboratory Sciences staff has completed additional barrier and ignition tests with additional cover fabrics. The results of this work indicate that some barriers complying with the alternate seating area test may not always provide protection to the foam filling material when combined with certain cover fabrics in small open flame and/or smoldering ignition source tests. Regarding API's comment, the CPSC Laboratory Sciences staff agrees and has seen similar test results with some barrier fabrics with certain cover fabrics. These barrier fabrics, while qualified using the alternate barrier test in the CPSC staff draft *Upholstered Furniture Standard,* did not always provide protection to the foam filling material when tested with upholstery fabrics using the draft small open flame test (20 second application of flame) or a smoldering ignition source. Staff is continuing to explore ways to address this issue. Thus, regarding the AFMA and Wellman comments, the CPSC Laboratory Sciences staff believes the work done to date does not support the statements that crib no. 5 is too severe a test to evaluate barrier fabrics.

Alessandra And Other FR-Fiber Fabrics And Barriers Are Effective Alternatives

Comment: Alessandra products and technology are 'drop in' product forms for an economical solution. – McKinnon-Land, LLC

Comment: "Wellman supports the CPSC's proposal to allow manufacturers to conduct an alternative barrier test. … Evidence of success has been demonstrated by the British furniture industry responding to the UK regulations first introduced in 1988… ." – Wellman, Inc.

Response: Laboratory staff agrees that fabrics containing FR fibers are promising. Laboratory staff have evaluated a variety of barrier fabrics using the Alternate Barrier Test in the draft *Standard for Upholstered Furniture.* Some tested barriers met the criteria in the alternate test method and were also able to provide protection to the foam filling material even when tested with different upholstery cover fabrics using the small open flame test and when evaluated with a smoldering ignition source. However, none of the barrier fabrics successfully limited flame spread and fire growth on every cover fabric tested.

Barrier Alternative Allows More Escape Time

Comment: "By utilizing a fire-resistant barrier approach, the spread of fire that begins when furniture is ignited by a small, open flame can be significantly deterred by preventing other furniture components from becoming involved. … it can help ensure that the furniture involved does not produce enough heat to cause a flashover situation. Significantly, it can

[1] Memorandum to Dale Ray, Project Manager, Upholstered Furniture, from L. Fansler, Division of Electrical Engineering, "Alternate Barrier Tests", October 23, 2001.

afford residents additional time to call for emergency services, vacate the area, or perhaps even extinguish the fire themselves." – Zoltek Corporation

Response: Some barriers tested by the CPSC Laboratory have shown promise in that they effectively protect the foam filling material and slow down the flame spread initiated by the small open flame source. These types of barriers can offer additional escape time by limiting fire growth and smoke production. However, barriers do not prevent cover fabrics from igniting and therefore can not prevent other nearby materials from becoming involved in a fire scenario.

Standard Fabric for Barrier Testing or Standard Fabric Classes

Comment: "Results suitable for categorization or statistical analysis. Further evaluate methods for classification of materials." – Alliance For The Polyurethanes Industry

Response: The CPSC Laboratory Sciences staff included a variety of cover fabrics in tests evaluating different barrier fabrics to the alternate barrier protocol in the staff's draft *Upholstered Furniture Standard*. Some of the results obtained from barrier testing illustrate the difficulty in developing a fabric classification scheme. For example, two medium weight cotton cover fabrics selected for testing[2] exhibited different ignitability: a cotton twill fabric (9.0 oz/yd^2) had approximately half as many non-ignitions as did a cotton corduroy fabric (11.5 oz/yd^2). Also, among the cover fabrics was an inherently FR polyester fabric, the same standard cover fabric specified in the British Regulations.[2] This cover fabric may have affected crib test results for several of the barriers – some positively, some negatively. Thus, CPSC Laboratory Sciences staff believes that a fabric classification scheme may be difficult to develop, as there is such a variety in upholstery fabrics on the market and a significant number of additional tests would need to be done to develop a defensible fabric classification scheme.

FR Treatments Result in UFAC Class I Fabrics Becoming Class II Fabrics

Comment: "CPSC should recognize that fire retardant treatments for open flame resistance can adversely affect smoldering ignition propensity. ...in studies with fabrics backcoated in the US and the UK to pass BS 5852 and the 1997 CPSC tests, most cotton fabrics that were UFAC Class I became Class II. [This is considered a failure of the test; UFAC Class II fabrics require an approved barrier between the fabric and conventional polyurethane foam in the horizontal seating surfaces; Class I fabrics can be used directly over conventional polyurethane foam.]"-National Cotton Council of America

Response: The CPSC Laboratory performed cigarette ignition tests on fabrics taken from upholstered chairs purchased from the United Kingdom (UK).[3] In the UK chair tests, 11 of the 14 predominantly cellulosic fabrics resisted cigarette ignition. These full-scale tests

[2] BS 5852:1990, Methods of Test for Assessment of the Ignitability of Upholstered Seating by Smouldering and Flaming Ignition Sources, British Standards Institution, London.

[3] Briefing Package, Upholstered Furniture Flammability: Regulatory Options, to The Commission, from Dale Ray, Project Manager, October 30, 2001, CPSC.

were supplemented with small-scale mockup tests using the UK fabrics over standard (non-FR) polyurethane foam.

Cigarette mockup tests were also conducted on a set of five cotton upholstery fabrics both with and without FR backcoatings. Two of the sets of cotton fabrics were UFAC Class I fabrics. The three other sets of cotton fabrics were not tested to the UFAC protocol; however, they were tested to a modified version using the larger CPSC mockup specified in the draft *Upholstered Furniture Standard*. In these tests, one set (A) of cotton fabrics had ignitions on both FR backcoated and uncoated versions of the fabric. Another set (B) ignited on the uncoated fabric mockups but did not ignite on the FR backcoated mockups and the third set (C) did not ignite on the uncoated fabric mockups but ignited on the FR backcoated mockups.

Mockups covered with the cotton fabrics in set (C) did not meet the requirements of the CPSC staff's draft *Upholstered Furniture Standard*. Therefore, the fabrics in set (C) would not be used since neither is resistant to the specified small open flame source.

Cleaning and Durability Not Adequately Addressed

Two commenters raised concerns regarding the lack of cleaning and durability requirements in the draft standard. Their comments are:

Comment: "One further item we believe has not been properly identified and considered is cleaning and durability. No portion of their proposed standard addresses what happens if the furniture is cleaned nor how durability will be tested over the expected 14+ years of life for upholstery furniture." – Culp, Inc.

Comment: "... the durability of FR treatment throughout the life of the upholstery product remains unknown. ... constant evidence of severe backcoating deterioration." – Upholstered Furniture Action Council (UFAC)

Response: A limited study[4] of cleaning and wear on upholstery fabric flammability and the durability of a FR chemical backcoating was performed by the CPSC Laboratory staff in 1999. A professional upholstery cleaner cleaned three FR treated upholstery fabrics using commercial products and equipment. CPSC Laboratory staff cleaned identical fabrics using a product designed for home use. One of these fabrics was stretched over foam backed by a wood platform to simulate a seating surface and pounded repeatedly before and after cleaning – similar to the constant force test method in ASTM D 3574, "Standard Test Methods for Flexible Cellular Materials – Slab, Bonded, and Molded Urethane Foams." Laboratory staff determined that cleaning and pounding had no significant effect on the flammability of the fabrics studied and that there was no need, at that time, to consider durability or cleaning requirements beyond the water-soak requirement in the draft standard. The CPSC Laboratory staff will continue durability and cleaning evaluations to assess these effects on barrier materials and newer FR treatments compared to those tested in 1999.

[4] Memorandum to Dale Ray, Project Manager, Upholstered Furniture, from W. Tao, G. Sushinsky, B. Bhooshan, and D. Cobb, Laboratory Sciences, "Cleaning and Wear Effects on Upholstery Fabric Flammability", May 31, 2000.

TAB D

United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

DATE: December 27, 2002

TO : Dale R. Ray, Upholstered Furniture Project Manager

Through: Warren J. Prunella, AED, Economics W/P

FROM : Charles Smith, Economics C.L.S.

SUBJECT: Upholstered Furniture Flammability: Analysis of Comments from the June 2002 Public Meeting

The U.S. Consumer Product Safety Commission (CPSC) staff held a public meeting June 18-19, 2002, to discuss upholstered furniture flammability. The focus of the discussions was the draft upholstered furniture flammability standard and supporting information developed by CPSC staff and included in the October 30, 2001 briefing package *(Upholstered Furniture Flammability: Regulatory Options)*, the progress of outside groups in addressing the same problem, and recent developments in related flammability issues. The Commission invited written comments and oral presentations from individuals, associations, firms, and government agencies with information or comments related to the briefing package.

This memorandum discusses economic issues raised by individuals and organizations who attended the public meeting or submitted comments.

Public Meeting Statements

American Furniture Manufacturers Association (AFMA) (Andy Counts)

AFMA is the national association for furniture manufacturers. Mr. Counts, AFMA's Executive Vice President, made the following comments on economic issues at the Public Meeting:

Comments: *The option of allowing qualified barrier materials may provide significant advantages: "it would minimize the burden of sampling, testing and record[keeping];" "it would preserve fabric choice [and it] would also deal more sensibly with limited run fabrics and COM's, which would otherwise be consumed by testing"; "Furniture manufacturers and consumers especially concerned about chemical content would have*

access to flame resistant product which contains no chemical flame retardants...." (Note: The Upholstered Furniture Action Council (UFAC), the Polyurethane Foam Association (PFA), INDA, Association of the Nonwoven Fabrics Industry, Decorative Fabrics Association, Calico Corners, Kravet, Inc., Wellman, Inc., and Zoltek also provided comments in support of the addition of a barrier option for compliance with the standard.)

Response: The staff agrees that the barrier alternative may be preferred by many fabric and furniture manufacturers that market or use fabrics that would present greater technical difficulties, costs, or adverse aesthetic effects if FR treatments were used. Although consumers and manufacturers may have concerns about the use of FR chemicals, the staff believes many fabrics can be treated with FR chemicals without presenting a significant risk to consumers. Nevertheless, AFMA is correct that the option to use FR barrier materials may be viewed favorably by some, because of those concerns.

Comments: *"Given the advantages of constructions utilizing interliners, we believe the stakeholders should work together to make this option viable for as broad a segment of the market as possible." Recommendations: "identify opportunities to minimize costs (e.g., ways around true "double-upholstering?"); develop FR polyester battings.*

Response: It is in the interest of the affected industries to develop less-costly means of complying with the standard. The development of FR battings that could act as complying barrier materials would be very advantageous. This potential was also the subject of a comment submitted by Mr. Cary Kravet, President of Kravet, Inc., on behalf of the Decorative Fabrics Association. Such advances may well reduce future costs of compliance with the standard, and expand the economic feasibility of the barrier option to a broader segment of the market.

Comments: *"The stakeholders may wish to consider the incorporation into the CPSC approach the use of FR foam." (The National Association of State Fire Marshals specifically recommended that the draft CPSC standard include requirements for filling materials.)*

Response: Manufacturers could use FR foam under the draft standard. However, information available to the staff regarding the additional reduction in the risks presented by small open flames did not warrant the inclusion of a provision in the draft standard related to filling materials.

Comment: *CPSC can assist in making sure that appropriate materials are available by setting an effective date for any regulation that allows suppliers adequate time to digest the standard, and to commercialize and ramp up production of compliant materials. An effective date of at least 36 moths from publication of any rule appears warranted.*

Response: The staff agrees that adopting a longer period before the standard becomes effective would provide the affected industries with additional time to adapt their production to the new requirements. Furniture manufacturers would be afforded additional time to use stocks of untreated fabrics that do not comply with the standard's

testing provisions and fabric manufacturers and finishers might develop more effective and efficient processes to comply with the standard. The beneficial effects of this alternative for the affected industries would be offset by the additional delay in the availability of complying furniture to consumers. The issue of a reasonable effective date will be addressed further in the preliminary regulatory analysis for the rule.

The Upholstered Furniture Action Council (UFAC) (Joseph Ziolkowski)

Members of the furniture industry formed UFAC in the 1970's to address the cigarette ignition hazard associated with upholstered furniture. The UFAC Voluntary Action Program to reduce the cigarette ignition propensity of furniture components has been adopted by firms that manufacture most upholstered furniture sold in the U.S. UFAC's Technical Director, Mr. Ziolkowski, made the following comments on economic issues:

Comment: *UFAC is pleased that the CPSC draft standard would allow the use of interliners as an alternative compliance option, because we believe that this is an approach that holds the most promise for meeting our criteria for an effective standard.*

Response: (See the response above to the similar point made by AFMA.)

Comments: *Quality control in applying the proper amount of FR chemicals remains difficult to maintain in the UK. Double- and triple-coating is still very common, resulting in stiff fabric which most American consumers do not find acceptable.* [Note: Quaker, Culp, Joan/Mastercraft, Wearbest Sil-Tex Mills, and others also commented that adverse esthetic effects result from FR treatment of upholstery fabrics.]

Response: Although UK textile and furniture firms report that earlier problems with stiff fabrics largely has been resolved, the CPSC staff recognizes that there are difficulties in treating some fabrics. The option to use barrier materials under the standard would provide a solution for furniture manufacturers that want to continue use of those fabrics. In time, other advances such as the incorporation of inherently flame resistant fibers could also be cost-effective solutions for producing complying furniture.

Comment: *UFAC commented that interliners (FR barriers) would meet the organization's criterion of being marketable if more work was done to develop a variety of barriers at lower price points than currently available.*

Response: The development of a variety of barrier materials at lower costs would likely expand their use beyond furniture made with expensive decorative fabrics that are more difficult and costly to treat with FR chemicals.

Quaker Fabric (David Pettey)

Quaker is one of the leading manufacturers of upholstery fabric in the U.S. The firm's Director of Corporate Technology and Product Development, David Pettey, made the following comments on economic issues at the public meeting:

Comment: *Cigarette ignitions are best addressed through public education and/or the development of self-extinguishing cigarettes.*

Response: To the extent that self-extinguishing cigarettes and other forces reduce fire losses in the future, the expected benefits of the standard would decline. Such effects will be examined as part of a preliminary regulatory analysis if information is available.

Comments: *Substantial costs of compliance with the draft standard are estimated based on reduced processing line speeds because of the increased amount of backcoating that would have to be applied to fabrics. According to Quaker, processing time would be doubled (requiring 18 lines rather than 9).*

Response: According to information provided by the largest and most experienced FR backcoating firm in the UK, the impact of FR backcoating on processing costs generally would be less than Quaker's estimates. The experience of the UK firm shows that FR backcoating materials are generally applied at lower weights than indicated by the Quaker cost estimates, and line speeds would not be as severely affected by the application of FR backcoatings.

Quaker estimates the dry weight of FR backcoating system required to comply with the draft standard to be 29.25 million pounds per year. Mr. Pettey stated that Quaker produces 1.5 million yards of upholstery fabric per week. At an average of 1.5 yards in width, this is about 2.25 million square yards of fabric per week, and perhaps 117 million square yards per year. Based on this information from Quaker, the estimated weight of the FR backcoating system is approximately 4 ounces per square yard. This FR application is greater than customary in the UK. The UK firm typically applies backcoatings of about 1.5 ounces per square yard for medium weight fabrics and between 2 and 3 ounces per square yard for heavier fabrics to achieve compliance with the open flame test of the UK furniture regulation. This test is similar to the seating area test of the standard drafted by CPSC staff.

The UK backcoating firm reports that line speeds for FR backcoating for the applications done on heavier weight fabrics are only about one-third slower than line speeds for non-FR backcoating that is routinely done on upholstery fabrics (including about 95 percent of Quaker's fabric yardage in 1998). The UK firm reports that backcoating of medium weight fabrics can be done at the same line speed as non-FR backcoating for dimensional stability. Based on this experience, degradation of processing line speeds, and, potentially, the extent to which additional processing equipment would be necessary, would depend on fabric weights. However, the UK experience indicates that Quaker's estimated impacts may be overstated.

Comment: *A fabric that inherently passes an open flame test 80% of the time would only have a 6.87 percent chance of passing 12 tests needed to certify the production for use under the standard. Therefore, nearly all production would have to be "reworked" and retested. According to Quaker's estimates, this reworking of nearly all fabrics would*

require an additional doubling of finishing process lines, totaling 36. Quaker also estimated that a new building would be needed to house the additional processing lines.

Response: If only 80 percent of FR treated fabric samples pass the seating area test of the standard, Mr. Pettey is correct that extensive additional testing would be required, and a considerable percentage of fabric yardage would have to be reprocessed to apply the additional FR chemicals necessary to achieve passing results. Also, reduced sampling permitted with repeated passing results would not be realized.

However, it is likely that the industry will develop processes to treat fabrics that achieve higher passing rates so that extensive additional testing and treatment could be avoided. Further, Quaker estimates apparently assume that any reprocessing would be done at the reduced line speeds of the initial FR application. According to the UK finisher, secondary backcoating runs involve less FR chemical backcoating per yard than the initial applications, and, therefore, faster line speeds. Therefore, the assumption that is apparent in Quaker's estimates that the same line speeds would be required for the reworking as for the initial FR treatment probably leads to an additional overstatement of required finishing capacity.

Comment: *Quaker also estimates that substantial costs of the standard would result from material and labor costs of testing.*

Response: Quaker estimates that 12 yards of fabric would be required per sample (three segments of fabric taken from the beginning, middle, and end of the processing run). The draft standard specifies that the cover fabric needed for the test is 1100 mm x 650 mm. Based on this specification, the staff believes that about 7 linear yards of fabric would be required to conduct 12 tests. Further, Quaker estimates that if testing failures are found among the 12 sample tests, 12 additional yards of fabric would be required for testing. This is not the case, since additional samples for testing would only be taken adjacent to segments that had failing test specimens.

Quaker estimates that one testing technician would conduct one test per hour, at a labor cost of $17 per hour. Based on the experience of the leading UK backcoating firm, this estimate of labor time devoted to each test is grossly overstated. Also, Culp, Inc. (discussed below) estimates the total cost of labor, fabric, and foam to be $13.63 per test.

Comment: *Expected price increases (estimated by Quaker to be 15%) make it more likely than not that consumers will resort to second hand furniture and slipcover options, long before they advance to purchases of FR furniture.*

Response: The Directorate for Economic Analysis estimates that the standard would result in average price increases of about $22-$34 for items made with FR treated upholstery fabrics. Such increases would be on the order of 3-5 percent, rather than the 15 percent estimated by Quaker. Nevertheless, the unit price increases may influence purchasing decisions. It is always difficult to determine what consumer reaction would be when both the price and performance characteristics of products change. Consumers may,

for example, purchase different styles or fabrics than they would in the absence of any standard-related price increases. Some consumers might be more likely to turn to increased use of credit or they might rent furniture, with or without the option to buy. They may also postpone purchases, as suggested by Quaker, by purchasing slipcovers or throws. To the extent that consumers postpone purchases of new furniture, there would also be a postponement of realization of the benefits of the standard.

Comment: *The standard would lead to fewer and simpler fabric designs. This would remove the advantage in fashion content held by U.S. firms which up to now has served as a reasonably effective barrier to foreign competition. The standard would result in U.S. firms exiting the market for upholstery and lost jobs for employees.*

Response: To the extent that market forces provide a competitive advantage to foreign upholstery producers, or relieve disadvantages they have faced in the past, the standard could lead to increased market share for imported fabrics. The U.S. industry will be faced with the task of retaining its product offerings to maintain the advantages it may hold in fashion content. However, as noted in comments made by AFMA and others, the draft standard's barrier alternative should help to preserve fabric choice by allowing fabrics to be used without the need for FR treatment. The barrier option would moderate the impacts of the standard on fabric designs noted by Quaker.

Culp, Inc. (David Bell)

Culp is one of the largest suppliers of upholstery fabric. Mr. Bell states that Culp produces approximately 6 million yards of fabric a month for the furniture industry in the Upholstery Division. He made the following comments on economic issues:

Comments: *Estimated monthly testing costs (labor, foam, and fabric only) for Culp are $932,766, based on about 68,000 tests (an average of 12 tests per 1,000 yards produced). The annual costs, including testing of new patterns introduced, are estimated to be $12,239,592. The average estimated costs of labor, fabric, and foam for testing are about $13.63 per test.* [Note: If about 72 million yards of fabric are produced per year, estimated testing costs would be about $.17 per yard. Mr. Bell noted that their estimates assumed there were no retests due to inconsistent results, and no costs were added for burn chambers, recordkeeping, or other related expenses.]

Response: The operations of a large firm such as Culp probably would allow it to progress to reduced testing under the draft sampling plan of the standard. Thus, instead of 12 tests per 1,000 yards, the firm could soon progress to 8 tests for production runs up to 5,000 or 10,000 yards, assuming consistent seating area tests could be achieved. In the October 2001 *Economic Analysis of Regulatory Options*, the costs of fabric and personnel needed to conduct testing under the initial testing frequency of the sampling plan were estimated to be on the order of $.21 to $.28 per linear yard of fabric treated. This estimate may be higher than that of Culp largely because of the longer production runs done by a firm of Culp's size. Culp's estimates are based on 12 tests per 1,000 yards, whereas the preliminary estimates of the Directorate for Economic Analysis are based on the assumption that 12 tests are done on every 275 to 550 yards of fabric, on average.

Joan/Mastercraft (Lee Tomerlin)

Joan/Mastercraft is a leading manufacturer of upholstery fabrics in the U.S. Mr. Tomerlin made the following comments on behalf of the company:

Comments: *Sampling costs are excessive. The total estimated costs of testing for the Mastercraft Division would be $4,505,433 in the first year and $3,991,076 in subsequent years. Mr. Tomerlin stated at the meeting that costs incurred by other divisions of the company would double these costs.*

Response: The Directorate for Economic Analysis believes that the Joan/Mastercraft estimates of testing costs are fairly accurate.

Comment: *The draft standard will potentially limit consumer choice and freedom in the selection of upholstered furniture products.*

Response: The Directorate for Economic Analysis concurs that FR treated versions of some fabrics might not have acceptable aesthetic characteristics for use under the draft standard. Future advances in treatment methods may enable more fabrics to comply with the standard's seating area test. Additionally, fabrics that are determined to have unacceptable aesthetic characteristics following FR treatments would still be available to consumers if used over materials that comply with the barrier material alternative in the draft standard.

Weave Corporation (Roger Berkley)

Weave Corporation designs, weaves, and imports upholstery fabrics aimed at the higher end of the market. Mr. Berkley, the company President, made the following comments:

Comment: *[In addition to servicing the top of the market], we also supply middle market companies too. These customers are very price sensitive, and the need to double upholster ... will make it prohibitive for them to buy from us.*

Response: It is difficult for the staff to assess the impacts of the standard on individual companies. However, it is reasonable to assume that furniture manufacturers will have to determine whether they will comply using double upholstery and untreated fabrics, or by using treated fabrics without barrier materials. Manufacturers that use barriers, but attempt to hold down costs by using less expensive fabrics may find that they are at a competitive disadvantage against firms that use similar fabrics that have been FR treated.

Comment: *The furniture makers make all decisions about how potential components will be combined. It seems logical to do composite testing at this stage of the process since this is the point at which it is known for sure that the various components will become furniture.*

Response: Furniture manufacturers may use thousands of different fabrics during a year, with several different combinations of filling materials. Further, there are more than 1,500 furniture manufacturers that would be affected by composite testing at the furniture

manufacturing stage. Composite testing would result in a significantly greater overall test burden than would the seating area tests conducted by fabric manufacturers and finishers under the draft standard.

Comments: *The biggest burden we face with the new staff proposal involves testing. We must use outside laboratories. [Weave provided estimates of testing costs for the month of March 2002 in the range of $169,200 to $247,200.]*

Response: Smaller fabric producers such as Weave may have to send their production destined for upholstered furniture manufacturers to independent finishing firms for FR-treatment. It is likely that finishing firms would conduct testing. Available information indicates that this testing could be done at lower costs per test than if third party laboratories tested samples. Additionally, although preliminary estimates of testing costs by the Directorate for Economic Analysis were based on the assumption that independent finishers would sample from each distinct fabric included in a production run, actual practice under the standard may involve fewer tests. As experience is gained, fabric finishers may demonstrate that similar fabrics treated in a production run would be expected to have the same likelihood of passing the seating area test of the standard. Under these circumstances, sampling would be related to length of the production run rather than the lengths of the fabric segments that make up the run. If this understanding is not formalized in the rule, the staff would consider the effects of extending the minimum length of fabric subject to sampling from 50 yards to standard roll lengths, reportedly 55 to 60 yards.

McKinnon-Land-Moran, LLC (MLM) (Frank Land)

MLM is a firm that has recently developed a process for the production of fabrics that are reportedly flame resistant without the need for treatment by FR chemicals. Frank Land, MLM President and COO, made the following comments at the public meeting:

Comments: *[MLM's] product, Alessandra, provides an effective and available technology to meet the draft standard.*

Response: The MLM product reportedly incorporates inherently-FR melamine fibers within traditional upholstery fabric fibers. These composite yarns may be used to make flame resistant upholstery fabrics with the aesthetic qualities of traditional fabrics. The Directorate for Economic Analysis' preliminary cost estimates are based on the assumption that upholstery fabrics would be treated with FR chemicals in secondary finishing operations. However, the use of inherently-FR fibers such as those reportedly made possible by the MLM process have the potential for producing fabrics without many of the costs and other issues associated with the use of treated fabrics.

National Association of State Fire Marshals (NASFM) (Donald P. Bliss)

NASFM is the organization whose petition began the most recent proceeding on upholstered furniture flammability. Mr. Bliss is a Vice President of NASFM and Fire Marshal for the State of New Hampshire. He made the following comments on economic issues at the public meeting:

Comment: *The CPSC standard should include requirements related to filling materials. The standard should maximize flexibility for manufacturers to comply.*

Response: As noted in the response to AFMA, manufacturers could use FR foam under the standard. However, information available to the staff regarding the additional reduction in the risks presented by small open flames did not warrant the inclusion of provisions related to flexible polyurethane foam filling materials. The standard has been drafted to allow manufacturers flexibility in means of compliance by accepting test results from a seating area test of fabric over standard polyurethane foam or with actual filling materials that would be used, or through the use of complying barrier materials.

Fire Retardant Chemicals Association (FRCA) (William E. Horn, Jr.)

The FRCA is the national association of manufacturers that provides FR chemicals used in the treatment of textiles and many other applications. The association's executive Vice President, Mr. Horn, provided the following comments:

Comments: *Filling materials should be flame resistant in furniture constructions where barrier materials are not utilized. The draft standard does not address large open flame fires.*

Response: The draft standard has been designed with the intent to prevent losses from fires started by small open flame sources such as lighters and matches. Upholstery fabrics that comply with the seating area testing provisions will be effective in preventing ignition from small open flame sources, preventing the combustion of filling materials. Therefore, additional requirements relating to ignition resistance of filling materials are not warranted. That portion of the petition filed by the National Association of State Fire Marshals that sought a standard addressing large open flame sources was previously denied by the Commission.

Written Statements Submitted in Response to the Federal Register Notice that Announced the Public Meeting:

University of Surrey (UK) (Dr. Gary Stevens, Alan Mann, and Dr. Alan Emsley)

Drs. Stevens and Emsley and Mr. Mann, of the University of Surrey, submitted the following comments based on their analysis of the UK furniture flammability standard:

Comment: *In addition to discussing regulatory developments and FR chemical risk assessments being done in Europe, the commenters noted that preliminary results from a re-examination of the effectiveness of the 1988 UK furniture flammability regulations have shown that the earlier benefits estimated "are sustained even when account is taken of decreasing smoking trends in the population and increasing domestic smoke alarm penetration in the UK."*

Response: While not commenting on the findings of the previous study, the Economics staff notes that its current analysis also accounts for decreasing smoking trends and other

factors that would be expected to reduce fire losses in the absence of regulation by the CPSC.

American Fiber and Yarns (Nicolette Rainey)

American Fiber and Yarns reportedly provides synthetic fibers to major upholstery fabric producers, *e.g.*, Quaker, Culp, and Joan/Mastercraft. The company's Market Manager, Ms. Rainey submitted a general comment that substantial costs and business failures would result from the standard, in addition to these more detailed comments on economic issues in a June 28, 2002, letter to the CPSC:

Comments: *It does not appear that the regulatory agencies have considered whether the burning of millions of yards of fabric, foam, fillings, and battings that have been treated with flame retardant chemicals will have an impact on air quality.*

Response: The issue of disposal of furniture that had been treated with FR chemicals was addressed in the report, *Upholstered Furniture Small Open Flame Ignition Resistance Standard: Environmental Effects,* by Robert Franklin of the Directorate for Economic Analysis (p. 868 of the October 2001 staff briefing package). That report noted that incineration of some flame retardants can, under some conditions, create toxic combustion products such as furans and dioxins. However, the use of FR chemicals under the draft standard should not significantly increase the production of toxic chemicals when discarded items are incinerated.

Wearbest Sil-Tex Mills, Ltd. (Adity Phadnis)

The Director of Quality for Wearbest Sil-Tex Mills, a manufacturer of upholstery fabrics, submitted the following comments in a June 7, 2002, letter to the CPSC:

Comments: *Some fabrics might not meet the test even with FR. FR treatment will cost $2-3 per yard (citing information from independent backcoating firm, Synfin). Fire barriers "can increase the cost of a piece of furniture making it unusable for furniture suppliers." Regarding testing, Wearbest's standard production unit is 60 yards – CPSC requires 3 tests per 60 yards piece. If Wearbest produces 250 pieces per week that are FR treated, they would have to perform 750 tests. Govmark Organization has approximated the cost to be $190 per test: $190 x 750 = $142,500 per week x 50 weeks per year = $7,125,000 per year. Company definitely cannot afford this testing cost. There would also be recordkeeping costs.*

Response: The estimate of $2-$3 per yard for FR treatment (provided to Wearbest by an independent fabric finisher) could reflect premiums for treatment of small quantities of fabric by third party finishers; such premiums have been brought to the attention of the staff in previous comments. Initially, shorter lengths of fabric receiving FR treatments would require a greater percentage of yardage to be subjected to testing. It is likely that the firms doing the treatment would do testing at a lower cost than available from independent testing facilities. Further, in a February 2001 report prepared for the American Textile Manufacturers Association, Glassman-Oliver Economic Consultants, Inc., reported an average testing fee of $135 for firms it surveyed. The Economics staff

agrees that firms would incur costs related to recordkeeping. These costs have been included in estimated costs of the draft standard.

TAB E

United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

MEMORANDUM

DATE: December 2, 2002

TO : Dale Ray, Project Manager for Upholstered Furniture
Directorate for Economic Analysis

Through : Mary Ann Danello, Ph.D., Associate Executive Director for Health Sciences MAD
Lori E. Saltzman, M.S., Director, Division of Health Sciences

FROM : Michael A. Babich, Ph.D., Chemist, Division of Health Sciences MAB

SUBJECT : Health Sciences response to public hearing comments on upholstered furniture

On June 18-19, 2002, the U.S. Consumer Product Safety Commission (CPSC) staff held a public meeting to hear testimony on the Upholstered Furniture project. Commenters presented testimony on a variety of topics such as the draft CPSC staff flammability standard, estimated costs and potential benefits of the draft standard, and the toxicity of flame retardant chemicals. The purpose of this memorandum is to present the response of the Directorate for Health Sciences staff to testimony presented at the meeting with respect to the toxicity of flame retardant (FR) chemicals.

Comment: The National Association of State Fire Marshals discussed the potential toxicity of flame retardant (FR) chemicals. They stated that not all FR chemicals are harmful either to humans or the environment, and that only chemicals that are not hazardous should be used to meet the draft CPSC standard. They stated further that the risks from residential fires are well-documented, whereas there are no incidence data regarding the risks from chronic exposure to FR chemicals.

Response: The CPSC staff agrees that a number of the FR chemicals proposed for use in upholstered furniture would not present a hazard to consumers (NRC 2000; CPSC 2001). Any FR chemicals used in upholstered furniture must comply with the general requirements of the Federal Hazardous Substances Act (FHSA), which is administered by CPSC; Toxic Substances

Control Act (TSCA), which is administered by the U.S. Environmental Protection Agency (EPA); and any regulations issued under these statutes. The CPSC staff continues to work with the EPA to develop a significant new use rule (SNUR) that would apply to FR chemicals manufactured for use in upholstered furniture. If the SNUR is adopted, manufacturers would be subject to EPA review before manufacturing chemicals for this purpose. EPA would review the potential risks to consumers, workers, and the environment. The SNUR could be used to obtain additional data, if needed.

The CPSC staff also agrees that the risks from residential fires involving upholstered furniture are well-documented. It is generally not possible to establish a causal link between chronic health effects such as cancer and specific environmental or consumer exposures. For this reason, it is essential that all FR chemicals under consideration for use in upholstered furniture be thoroughly evaluated for potential hazards and that manufacturers comply with the requirements of the FHSA and TSCA.

Comment: The National Cotton Council (NCC) commented that FR chemicals used to meet a CPSC standard should meet the toxicity requirements for fire retardants in the revised European Union "Eco-Label" program for textiles.

Response: The CPSC staff agrees that FR chemicals should not be used to meet a CPSC flammability standard if they are hazardous to consumers, workers, or the environment. Any FR chemicals used in upholstered furniture must comply with the general requirements of the FHSA, which is administered by CPSC; TSCA, which is administered by EPA; and any regulations issued under these statutes. The CPSC staff continues to work with the EPA to develop a significant new use rule (SNUR) that would apply to FR chemicals manufactured for use in upholstered furniture. If the SNUR is adopted, manufacturers would be subject to EPA review before manufacturing chemicals for this purpose. EPA would review the potential risks to consumers, workers, and the environment. The SNUR could be used to obtain additional data, if needed.

The "Eco-Label" program described by the NCC is a hazard-based program. That is, chemicals requiring labeling for various human health or ecological hazards are not permitted to be used if they are present at levels greater than 0.1 percent by weight. The FHSA, however, is risk-based. Under the FHSA, exposure and risk must be considered in addition to toxicity in determining whether a particular substance may be hazardous to consumers. Such a risk-based approach for evaluating potential hazards in consumer products is required by the FHSA.

Comment: Representatives from the University of Surrey described a research program to develop additional information on exposure to FR chemicals in upholstery fabrics.

Response: The National Research Council (NRC 2000) and the CPSC staff (CPSC 2001) have discussed additional data needed to assess the potential health risks associated with the use of FR chemicals in upholstered furniture fabrics. Both groups cited the need for additional data on exposure to respirable dusts containing antimony trioxide. The CPSC staff developed data

relating to dermal and oral exposure, but not inhalation exposure, for five different FR chemicals. However, 16 chemicals or chemical classes, over 50 individual compounds, have been proposed for use in upholstered furniture. The research program described by the commenters will provide data on the potential for inhalation exposure to antimony trioxide. The program will also provide exposure data on additional FR chemicals by various exposure routes and pathways.

Comment: Representatives of the University of Surrey discussed recent regulatory developments regarding certain FR chemicals in Europe. The European Union is conducting comprehensive risk assessments for various FR chemicals, including antimony trioxide, decabromodiphenyl oxide, and hexabromocyclododecane. The European Union also has proposed a ban of pentabromodiphenyl oxide (ether) (penta-BDE).

Response: The CPSC staff is monitoring developments in the risk assessment and regulation of FR chemicals in Europe. The risk assessments being conducted by the European Union include potential effects on human health and the environment from all possible exposure routes and scenarios. Conducting exposure assessments for FR chemicals such as antimony trioxide, decabromodiphenyl oxide, and hexabromocyclododecane is prudent, but does not necessarily mean that these chemicals will be found to be hazardous or that they will be regulated.

Penta-BDE is used as a FR additive in plastics and electronics equipment, and in some FR-treated upholstery foam (McDonald 2002). Concerns about penta-BDE are based primarily on its presence in the environment and in human tissue samples. Most human exposure is believed to occur from food (Wenning 2002). Penta-BDE is not one of the FR chemicals proposed for use in upholstery fabric to meet a possible CPSC standard.

Comment: The Upholstered Furniture Action Council (UFAC) testified that they do not consider FR chemicals to be safe. They also noted that additional exposure data are needed for antimony trioxide. Furthermore, they claimed that the U.S. Environmental Protection Agency (EPA) is not interested in issuing a significant new use rule (SNUR) and that, if a SNUR is issued, it should be done before CPSC issues a flammability standard.

Response: Several of the FR chemicals proposed for use in upholstered furniture would not present a hazard to consumers (NRC 2000; CPSC 2001). FR chemicals and FR-treated upholstered furniture would be subject to the general requirements of the FHSA, which is administered by CPSC; TSCA, which is administered by EPA; and any regulations issued under these statutes. The National Research Council (NRC 2000) and the CPSC staff (CPSC 2001) have discussed additional data needed to assess the potential health risks associated with the use of FR chemicals in upholstered furniture fabrics. Both groups cited the need for additional data on exposure to respirable dusts containing antimony trioxide. The CPSC staff continues to work with the U.S. Environmental Protection Agency (EPA) to develop a significant new use rule (SNUR) that would apply to FR chemicals manufactured for use in upholstered furniture. A SNUR would likely be issued in conjunction with any proposed CPSC flammability requirement. If the SNUR is adopted, manufacturers would be subject to EPA review before manufacturing chemicals for this purpose. EPA would review the potential risks to consumers, workers, and the

environment. The SNUR could be used to obtain additional data, such as exposure data for antimony, if needed. Furthermore, a research program is underway at the University of Surrey that will provide additional exposure data on many FR chemicals (see above).

Comment: Akzo-Nobel Functional Chemicals LLC, a manufacturer of flame-retardant chemicals, commented on the use of a particular FR chemical. They commented that tris (1,3-dichloro-2-propyl) phosphate (TDCP) is appropriate for use in upholstery foam, but should not be used to treat upholstery fabric.

Response: The National Research Council (NRC 2000) and the CPSC staff (CPSC 2001) considered the possible use of TDCP to treat upholstery fabric. Both groups concluded that additional exposure data would be needed to determine whether TDCP in upholstery fabric would present a hazard to consumers. Neither of these two recent risk assessments considered the use of TDCP in upholstery foam.

Comment: Zoltek, a manufacturer of inherently flame resistant fibers, commented that the use of a barrier instead of FR chemicals would reduce worker exposure to FR chemicals and any possible adverse health risks.

Response: The draft standard for upholstered furniture flammability is a performance standard. It would not mandate the use of FR chemicals to meet the standard. As described by the commenter, the draft standard also allows the use of a flame retardant barrier. The commenter manufactures inherently flame resistant fibers. The CPSC staff agrees that interliners or cover fabrics manufactured from inherently flame resistant fibers would not require treatment with FR chemicals to meet the draft standard.

References

Consumer Product Safety Commission (CPSC) (2001) CPSC staff exposure and risk assessment of flame retardant chemicals in residential upholstered furniture. U.S. Consumer Product Safety Commission, Bethesda, MD 20814. April 4, 2001.

MacDonald TA (2002) A perspective on the potential health risks of PBDEs. Chemosphere 46: 745-755.

National Research Council (NRC) (2000) Toxicological Risks of Selected Flame-Retardant Chemicals. Subcommittee on Flame Retardant Chemicals, National Research Council, National Academy of Sciences. National Academy Press, Washington, DC. ISBN 0-309-07047-3.

Wenning RJ (2002) Uncertainties and data needs in risk assessment of three commercial polybrominated dipehenyl ethers: probabalistic exposure analysis and comparison with European Commission results. Chemosphere 46: 779-796.

TAB F

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, DC 20207

Memorandum

Date: December 31, 2002

TO : Dale R. Ray, Project Manager, Upholstered Furniture
Directorate for Economic Analysis

THROUGH: Hugh M. McLaurin, Associate Executive Director
Directorate for Engineering Sciences

FROM : Carolyn Meiers, Engineering Psychologist
Directorate for Engineering Sciences

SUBJECT : Human Factors Analysis of Upholstered Furniture Public Meeting Comments

This memorandum presents the Human Factors staff response to relevant public comments received during the June 18-19, 2002 public meeting regarding small open flame ignitions of upholstered furniture. The comments recommended alternative means to prevent small open flame ignitions of upholstered furniture in lieu of mandatory regulations. The comments and staff responses to these recommendations are discussed below.

Comment: Adult supervision and education in the home can effectively address childplay fires. (Quaker, Weave, UFAC)

Response: Adult supervision and education of children in fire safety are critical and necessary components of fire prevention. However, children's innate curiosity, their inability to foresee consequences and the strong allure of fire can override the admonitions and safety precautions of adults. The motor abilities of children in the age range in which childplay fires occur make it nearly impossible to find a storage place for lighters and matches that prevents children from accessing them while allowing the products to be convenient to use. [1, 2] In addition, investigations of fires have shown that children have started fires while under adult supervision in the household. Some of these fires have been started in children's rooms and other areas of the house where children could be expected to play without having an adult directly in the room.

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1 Ames, L. B. & Illg. F.L. (1976). Your Two Year Old: Terrible or Tender. New York: Dell Publishing Co., Inc.
2 Ames, L. B. & Illg. F.L. (1976). Your Four Year Old: Wild and Wonderful. New York: Dell Publishing Co., Inc.

Comment: Before resorting to mandatory regulation, evaluate the effectiveness of non-regulatory strategies such as the promotion of public education campaigns and the encouragement of smoke detector use. (Weave, ATMI)

Response: Public education campaigns and smoke alarm use are essential fire prevention strategies. However, these strategies have not been completely successful in the prevention of small open flame ignitions. Smoke alarms are invaluable in the detection of fire, but will not prevent a fire. Passive measures that do not require actions on the part of consumers are more highly effective. Consumers have many ingrained habits and attitudes about fire safety that are difficult to change with public education messages, which are often ignored. Ingrained, careless behavior and indifferent attitudes toward fire safety may not be significantly changed by public education campaigns.

Summary of Staff Responses:

Information, education, supervision, and use of smoke alarms are necessary fire safety strategies, but they would be less effective in reducing deaths and injuries than a product standard.