

**FOLLOW-UP QUESTIONS ON UPHOLSTERED FURNITURE
SUBMITTED BY COMMISSIONER MARY SHEILA GALL**

December 22, 1997

1. What is the estimated rate of market penetration (or diffusion) for flame-resistant furniture? In other words, how much of the existing furniture that would be subject to a flame-resistance standard is generally replaced every year?
2. What information do we have on the average age of upholstered furniture typically involved in small open-flame and cigarette ignitions, versus the average age of upholstered furniture? Is there any significant difference?
3. What information does the staff have on the effect that age and condition have on the propensity of upholstered furniture to burn? Is an old, dirty couch more likely to burn than a new clean one?
4. One of the staff's interpretation of the observation that, while the number of fires attributed to smoking material or small open-flame ignition of upholstered furniture have decreased, deaths and injuries from those fires

have not gone down is that the toxicity of the smoke has increased due to changes in upholstered furniture designed to reduce cigarette ignition. Is it possible that there have been shifts in the patterns of upholstered furniture fires towards groups that are less likely to have working smoke detectors, or who are more likely to live in large families/groups that make fires more likely to result in multiple fatalities?

5. Has staff developed some sort of a regression analysis for the projected sales of new furniture, and adjusted that analysis to reflect the higher prices of flame resistant upholstered furniture?
6. Can the staff's analysis be further adjusted for the possibly reduced aesthetics of furniture with flame-retardant properties, which has been the U.K.'s experience?
7. Are the benefits from the flame-resistance of upholstered furniture realized at the time of sale, or at some point during the service life of that furniture when it resists flame that would have ignited a non-flame-resistant piece of upholstered furniture?

8. If the benefits of flame-resistant furniture are realized only at the time that it resists ignition that would have ignited a non-flame-resistant piece of upholstered furniture, should not those benefits be discounted to the present value for the year in which the exposure to flame occurs?
9. Shouldn't all estimates of property-loss savings from the proposed upholstered furniture flammability rule be measured against the declining baseline of upholstered furniture fires revealed in the 1995 fire loss estimates compiled by NFIR's and NFPA?
10. Shouldn't all estimates of savings from the proposed upholstered furniture flammability rule be measured against a declining baseline of smoldering cigarette ignitions of upholstered furniture? If no, why not?
11. Do the staff's calculations of economic costs and benefits take into account estimates of the likely compliance with the rule. From the Commission's experience with mandatory regulations for cribs, toys and fireworks we know that compliance will not be 100%. Did the staff perform any sensitivity analysis with different estimates of compliance?

12. Another source of potential noncompliance with an upholstered furniture flammability standard would be the use of customer-supplied material. Does the staff have any estimate on how widespread the practice of small manufacturers using material supplied by consumers to upholster or to reupholster furniture is?

13. Does the staff have data on how much furniture is slipcovered or reupholstered each year? Would a rule cover slipcovers or reupholstered furniture? If it would not, shouldn't the estimates of savings from fire prevention in such slipcovered or reupholstered furniture be subtracted from the overall estimates of savings?

14. If the proposed rule covers only the seating area of upholstered furniture, isn't it possible that manufacturers will use flame-resistant material only for the seating area and cover other areas with non-flame-resistant material? Can the estimated savings be adjusted to reflect possible ignitions of complying upholstered furniture in areas where even complying furniture may not have flame-resistant coverings?

15. Page 43 of the briefing package estimates a cost of \$29 per piece. Does this estimate account for the mark-ups that typically occur during the fabrication, manufacturing and distribution process (e . g . , inventory costs, interest and insurance expense)?
16. Did the staff consider the costs are involved for small textile or upholstered furniture manufacturers companies to apply FR treatment to some, but not all, fabrics in the production process and keep these two types of fabric segregated (i.e. time lags, storage, etc.)?
17. How were the testing costs on page 44 of the briefing package calculated?
18. The briefing package proposes to exclude commercial or institutional furniture from a proposed standard. What would prevent people from buying used, non-flame resistant furniture from "institutions" (hotels, motels, and offices) or second-hand stores that have purchased such furniture for resale?
19. The briefing package (page 46) notes that the annual costs a fire-resistance

standard for upholstered furniture may range from \$460 million to \$720 million, a difference of 56%. Did the staff run sensitivity analysis at the high and low ends of the estimate to see how that affected the result? If so, what did the sensitivity analysis reveal?

20. What testing will be necessary to ensure topical cleaning agents will not interfere with FR treatments and subsequent effects on bioavailability?
21. The briefing package states that the textile manufacturers are small businesses (employ less than 500). Most of these textile companies do not produce FR fabrics at this time. Did the staff take into account the costs that may be incurred by these small businessmen when they first introduce FR chemicals on their worksite? (i.e. safety handling and disposal requirements related to FR chemicals)
22. Does the staff contend that all presently used FR chemicals do not fall within "hazardous chemical" requirements for all federal and local regulations?

23. The staff is proposing a test protocol, and does not intend to rule on appropriate chemicals for FR treatment. Given all federal agency rules (DOT, EPA, OSHA, etc.) how does the staff propose to address any new chemical combination which is not presently used for FR purposes to ensure safety against acute or chronic hazards? (i.e., it took 15 years to deal with TRIS)
- a. Even though the IDIs collected by the staff for this package were not gathered from NEISS data and thus not statistically valid, staff considers them useful as a description of 'real life' occurrences.
 - b. Staff also stated that they expect their proposed standard would be 80% effective in preventing small open flame ignition fires on upholstered furniture.
 - c. Staff also stated that the benefits were calculated solely on the 20 to 25 million pieces of upholstered furniture that are sold each year.

24. Please describe again how the staff based their cost and benefit calculations given that the majority of furniture was listed as 'old or very old' for all of the 76 IDIs included in the study.
25. None of the child play with lighters was witnessed by an adult. The package states that human factors estimates a child will play with a lighter for up to 2 minutes. How can we assume that the child play (real life) incidents as described in the IDIs would have a flame exposed to the furniture for only 20 seconds since these children were alone without an adult in the room? What is the basis for staff to claim the proposed standard will prevent 80% of these typical cases, given some of the extreme circumstances of children left alone in their homes, etc.?
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26. Since many of the children's parents stated that the child had a history of playing with matches and lighters, is staff taking into account that most of these fires are set by more 'persistent' or 'aggressive' child play behavior. Is there a formula to weigh more aggressive/assertive child behavior against the typical? Do human factors studies take this more persistent behavior into account when performing their estimates?

27. All of the candle incidents had a flame exposed to the upholstered furniture for more than 2 minutes. How can these 'typical' real life incidents be prevented by a protocol that allows for only a 20 second flame exposure? What is the basis for staff to claim that this standard will prevent 80% of these incidents?
28. Of all the incidents, matches are probably more readily addressed by the proposed standard since human factors states a child will play with a match for approximate 30 seconds. Though the incidents contained in the package were not observed by an adult, those incidents caused by matches may be more within the reach of the proposed standard. What was the basis for staff to assume 80% of these incidents would be prevented?
29. Why did the staff include IDIs in their study that were totally out of the range of what is being considered, such as incidents involving:
- *a flare-gun (intense and large open flame);
 - *fireworks;
 - *two incidents involving lighters which stay lit when dropped because top is still open, resulting in an extended flame exposure;

***furniture stored in an outside shed on an abandoned property and another piece located on balcony, both of which are exposed to the elements;**

***deliberate fires started by older children who have a history of fireplay;**

***furniture which was covered by a slip-cover or a throw, thus the furniture itself was not the first source of ignition?**

30. Staff intends to include re-upholstered furniture in their proposed standard. How do they contemplate monitoring compliance with individuals who re-upholster furniture? Will all upholstery-type fabric produced by the textile manufacturers be required to be FR treated so that any individual who re-upholsters furniture will be in compliance?
31. Staff stated that the test protocol would only include testing on the cushion, assuming that the remainder of the upholstered piece will be covered in the same material. However, there are upholstered pieces where the backs and sides are in fact different fabrics (not just the leather vs. vinyl styles). Since FR treatment will raise the costs of fabrics, does the staff foresee incidents where more pieces are manufactured with

separate style non-FR fabrics to cut the cost?

32. Do many of the IDI's contained in the staff data indicate flaming beginning on the backs and sides of upholstered furniture? How would these statistics be taken into account to adjust the benefits projected by the staff since they do not have to have complying fabrics?
33. How would testing costs be effected if we required other upholstered areas of the furniture to be included, such as back, sides and skirts?
34. Since benefits are based on the sale of the 20-25 million pieces each year, when does the staff expect these pieces of furniture to find their way into lower income homes given the majority of 'real life' incidents indicate that the furniture was either purchased second hand or given to the families? How can staff estimate immediate benefits, given that the majority of families that are involved in these incidents are in the lower income level.
35. Staff stated that in Great Britain, furniture manufacturers supplied

incentives for purchasing new furniture which had higher prices as a result of the new British standard. Staff suggested that this could also be the case in the U.S. should their proposed standard become a rule. Did staff consider that 'incentives' are already utilized a great deal in U.S. furniture sales now just to encourage people to buy? Since retailers and manufacturers already offer deferred payments, deferred interest rates, purchases with no money down, etc., what does the staff anticipate manufacturers and retailers will devise next? At what market range (low or mid) are these sales incentives now aimed?

36. Staff stated that intumescence barrier fabrics do not release any fumes in the air. Would you explain again how this FR treatment works, and how there are no emissions as a result of their activation due to a flame.

**FOLLOW-UP QUESTIONS FROM COMMISSIONER THOMAS H. MOORE TO THE
STAFF ON THE UPHOLSTERED FURNITURE BRIEFING**

I. RISK OF DEATH OR INJURY

A. DURING THE BRIEFING, AND IN THE PACKAGE AS WELL, ALLUSIONS WERE MADE TO THE BELIEF HELD BY MANY PEOPLE IN THE FIRE COMMUNITY THAT THERMOPLASTICS CAN ACTUALLY MAKE A SMALL OPEN FLAME FIRE WORSE AND THAT THE USE OF THESE FABRICS TO FIGHT CIGARETTE IGNITION MAY BE PART OF THE REASON FOR THE INCREASE IN THE RISK OF INJURY IN SMALL OPEN FLAME FIRES. DOES THIS BELIEF REST ON ANY HARD DATA?

B. STAFF STATES THAT THE RISK OF INJURY AND DEATH HAS INCREASED IN SMOKING MATERIAL IGNITED UPHOLSTERED FURNITURE FIRES. ISN'T IT THE CASE THAT THE RISK OF INJURY AND DEATH HAS INCREASED FOR ALL RESIDENTIAL FIRES AS A WHOLE?

C. IS THERE ANY INFORMATION FROM THE FIRE FIGHTING COMMUNITY AS TO WHY THE NUMBER OF FIRES HAS GONE DOWN FASTER THAN THE NUMBER OF INJURIES AND DEATHS. ARE WE GETTING BETTER AS A NATION IN ELIMINATING THE SMALL FIRES THAT DON'T RESULT IN DEATH OR INJURY?

THERE ARE SOME IN THE FIRE FIGHTING COMMUNITY THAT MIGHT SEE THE STAFF PROPOSAL AS A CONTINUATION OF THE STRATEGY TO ATTACK THE SMALL FIRES: THAT PREVENTING IGNITION WILL REDUCE THE NUMBER OF FIRES, BUT ONLY BY PREVENTING THE BIG FIRES WILL YOU REDUCE THE DEATHS AND INJURIES. HOW DO YOU RESPOND TO THE SUGGESTION THAT IF CPSC HAS TO PICK EITHER FABRIC OR FOAM ON WHICH TO FOCUS ITS ATTENTIONS, THAT IT PICK FOAM, AS FOAM IS THE PRIMARY FUEL LOAD AND ONCE THE FIRE REALLY GETS GOING IT IS MUCH WORSE WHEN THE FOAM IS INVOLVED; AND IT WILL BE BY ATTACKING THOSE FIRES THAT WE WILL REDUCE DEATHS AND INJURIES FROM SMALL OPEN FLAME FIRES.

D. ON PAGE 55 OF THE PACKAGE THERE IS A STATEMENT THAT STAFF IDENTIFIED SOME FR FABRICS THAT SELF-EXTINGUISHED AND PRODUCED ENOUGH CHAR TO PROTECT THE FILLING MATERIALS UNDERNEATH. IS THE "SOME" A LIMITING FACTOR IN RELYING ON THE FABRIC ALONE TO RESIST IGNITION. THAT IS, ARE THERE FR FABRICS WHICH WON'T PRODUCE THE REQUISITE CHAR TO PROTECT THE FILLING MATERIAL?

II. EFFECTIVENESS OF PROPOSED STANDARD

A. DURING THE BRIEFING, THE STATEMENT WAS MADE THAT THE 80%

EFFECTIVE RATE FOR THE PROPOSED STANDARD WAS BASED ON LABORATORY TESTING OF FABRICS AND HOW THEY REACTED TO THE 20 SECOND FLAME. IS THAT THE ONLY FACTOR THAT WAS TAKEN INTO ACCOUNT IN DETERMINING HOW EFFECTIVE THE PROPOSED STANDARD WOULD BE?

B. WHAT PERCENTAGE OF THE SMALL OPEN FLAME FIRES STARTED BY CANDLES ARE YOU EXPECTING TO ELIMINATE WITH THE PROPOSED STANDARD?

III. CUSTOMER'S OWN MATERIALS

MANUFACTURERS WHO DEAL IN THE COM TRADE WOULD HAVE TO MAKE ARRANGEMENTS TO TEST AND FR TREAT FAIRLY SMALL AMOUNTS OF MATERIAL FOR EACH CUSTOMER. THAT COULD ADD A FAIR AMOUNT TO THE COST OF A COM. DO WE HAVE AN ESTIMATE OF THOSE COSTS? FOR EXAMPLE, DO WE KNOW HOW MUCH EXTRA MATERIAL A CUSTOMER WOULD HAVE TO SUPPLY TO PROVIDE ENOUGH FOR TESTING?

IV. OUR TESTING OF THE 27 CHAIRS (9 UK, 9 UFAC, 9 CAL.)

ON PAGE 188 OF THE PACKAGE IT STATES THAT FILLING MATERIALS OF THE UK CHAIRS WERE TESTED TO BS 5852 AND THAT ALL NINE UK CHAIRS FAILED TO MEET THE REQUIREMENTS OF THAT STANDARD. WHEN I ASKED AT THE BRIEFING WHY ALL THE UK CHAIRS FAILED THE UK TESTS THERE WAS A SUGGESTION THAT THE TEST THEY WERE SUBJECTED TO WAS SOMEWHAT DIFFERENT THAN WHAT THEY WOULD ACTUALLY BE SUBJECTED TO IN BRITAIN. CAN YOU EXPLAIN THAT A BIT MORE AND ALSO WHY WE WOULDN'T HAVE TESTED THEM TO THE TEST THEY WERE DESIGNED TO MEET.

ALL OF THE UK CHAIRS WE TESTED HAD INTERLINERS. SINCE WE ARE FOCUSING ON THE FABRIC IN OUR PROPOSED DRAFT STANDARD, AM I CORRECT IN ASSUMING THAT AN INTERLINER WOULD NOT BE AN OPTION FOR MEETING THE STANDARD UNDER OUR PROPOSAL?

IN THE FULL SCALE SEATING AREA TESTS, WE STOPPED THE TESTS ON THE UK CHAIRS ONCE THE FLAMES REACHED A PREDETERMINED MARK ON THE BACK OR SIDE OF THE CHAIR. DURING THE BRIEFING THE STATEMENT WAS MADE THAT "IF IGNITION HAD BEEN ALLOWED TO CONTINUE, THE WHOLE CHAIR WOULD HAVE BEEN INVOLVED IN THE FIRE". IF THIS IS THE CASE (AND A MAJORITY OF THE UK CHAIRS IGNITED IN 15 SECONDS), JUST HOW EFFECTIVE IS THE UK STANDARD IN REDUCING SMALL OPEN FLAME FIRES? AND IN THAT REGARD, HOW EXACTLY DOES OUR PROPOSED TEST DIFFER FROM THE BRITISH TEST?

V. SMALL OPEN FLAME VERSUS CIGARETTE IGNITION

A BASIC TENET OF THE STAFF'S TECHNICAL WORK (AND ANY STANDARD WE MIGHT PROPOSE ON SMALL OPEN FLAMES) IS THAT WE NOT INCREASE THE RISK OF CIGARETTE IGNITED FIRES. STAFF HAS ACKNOWLEDGED THAT MORE STUDY AND MORE INFORMATION HAS TO BE DONE IN THIS AREA. WHAT ADDITIONAL TESTING OR INFORMATION GATHERING IS THE STAFF PROPOSING TO DO AND WHEN WOULD IT BE DONE?

VI. DUST COVER REQUIREMENTS

ON PAGE 37, THE PACKAGE NOTES THAT THE MOST POPULAR AND LEAST EXPENSIVE DUST COVER MATERIAL IN USE IS ALREADY IGNITION RESISTANT AND "MAY BE ACCEPTABLE IN CONSTRUCTIONS WITHOUT IGNITABLE MATERIALS IMMEDIATELY ABOVE THE DUST COVER". THE ASSUMPTION IS THEN MADE THAT, EVEN THOUGH NOT MANY FIRES ARE ACTUALLY ATTRIBUTED TO THIS LOCATION, THE LOW COST OF THE DUST COVER PERFORMANCE PROVISIONS WOULD MAKE IT REASONABLE TO INCLUDE IT IN THE STANDARD, DO WE KNOW MUCH ABOUT WHY CERTAIN CHAIRS OR SOFAS ARE CONSTRUCTED TO HAVE THE DUST COVER IN CONTACT WITH MATERIALS UNDERNEATH? ARE THERE CERTAIN STYLES OR TYPES OF FURNITURE WHERE THIS IS NECESSARY OR DESIRABLE?

VII. CHILD PLAY

HAVE ANY STUDIES BEEN DONE ON CHILDREN'S FIREPLAY WHICH WOULD INDICATE HOW LONG A CHILD TYPICALLY HOLDS A CIGARETTE LIGHTER OR A MATCH OR WHAT THEIR PRECISE GOALS ARE IN PUTTING FLAME TO FURNITURE? DO WE KNOW IF THEY ARE STRIVING TO ACHIEVE IGNITION?

VIII. COST/BENEFIT

A. JUST TO CLARIFY A STATEMENT MADE AT THE BRIEFING. WHEN WE CAME UP WITH THE ESTIMATED INCREASE COST FOR FR TREATING FURNITURE (THE \$23-\$30 PER UNIT INCREASE) DOES THAT TAKE INTO ACCOUNT A MARKUP OF THOSE COSTS AT THE RETAIL LEVEL AND WHAT MARKUP DID STAFF UTILIZE?

B. IN A COUPLE OF PLACES STAFF TALKS ABOUT THE BENEFITS OF ONE YEAR'S WORTH OF PRODUCTION UNDER THE PROPOSED STANDARD. ONE PLACE IS ON PAGE 13 OF THE BRIEFING HANDOUT WHERE IT STATES THAT ONE YEAR'S PRODUCTION WOULD AVOID ABOUT 60 DEATHS FROM

SMALL OPEN FLAMES. SINCE ONLY APPROX. 90 TO 100 PEOPLE DIE IN ANY GIVEN YEAR FROM SMALL OPEN FLAMES, I ASSUME WHAT YOU ARE LOOKING AT IS THE NUMBER OF DEATHS OVER THE LIFE OF ALL OF THE UNITS AND NOT THE NUMBER OF LIVES SAVED IN ONE YEAR, IS THAT CORRECT? SIMILARLY ON PAGE 487 OF THE PACKAGE, IT IS SPECULATED THAT ONE YEAR'S PRODUCTION WOULD YIELD TOTAL SOCIETAL BENEFITS OF \$224 MILLION, BUT SINCE THE TOTAL COSTS IN ANY ONE YEAR FROM SMALL OPEN FLAME FIRES ARE ONLY \$470 MILLION, THE ESTIMATED BENEFITS MUST BE TAKING INTO ACCOUNT THE LIFE OF THE CHAIRS AND NOT THEIR BENEFIT IN JUST ONE YEAR? IS THAT CORRECT?

C. PLEASE EXPLAIN THE ANALYSIS WHICH IS SET OUT ON PAGES 660 TO 661, WHICH COMES TO THE CONCLUSION THAT 95% OF THE EXPECTED CIGARETTE IGNITION HAZARD COSTS ARE ATTRIBUTABLE TO THE 31% OF THE FURNITURE COVERED PREDOMINANTLY WITH CELLULOSIC FABRICS. IF CURRENT PRODUCTION IS ONLY 69% NON-CELLULOSIC, WHY DID STAFF FIND THAT 83% OF THE CURRENTLY MANUFACTURED FURNITURE COULD BE EXPECTED TO RESIST CIGARETTE IGNITION? WASN'T THE 83% FIGURE WEIGHTED BY FABRIC USAGE?

D. THE STATE FIRE MARSHAL'S PETITION NOTES AN ARTICLE BY J.F. KRASNY THAT SEEMS TO INDICATE THAT CELLULOSIC FABRICS CAN BE MADE MORE CIGARETTE IGNITION RESISTANT BY RINSING OUT CONTAMINANTS. DOES THE ARTICLE INDEED PRESENT A SIMPLE, COST EFFECTIVE WAY OF REDUCING CIGARETTE FIRES CAUSED BY CELLULOSIC FABRICS?

E. MOST OF THE BENEFITS OF THE PROPOSED STANDARD ARE DERIVED FROM THE REDUCTION OF FIRES DUE TO CIGARETTE IGNITIONS. IS THERE A LESS BURDENSOME ALTERNATIVE TO ACHIEVING THE CIGARETTE IGNITION FIRE REDUCTION RESULTS THAN REQUIRING FR TREATMENT?

IX. WAYS TO REDUCE MANUFACTURING COSTS

I KNOW STAFF STATED AT THE BRIEFING THAT THEY THOUGHT IT WAS UNLIKELY THAT MANUFACTURERS WOULD ONLY USE FR TREATMENTS ON THE SEATING AREA AND DUST COVER AND USE UNTREATED FABRICS ELSEWHERE, BUT I DIRECT YOUR ATTENTION TO PAGE 492 OF THE PACKAGE, WHERE THIS IS PROFFERED AS A COST CUTTING MEASURE. GIVEN THAT THE SIDE AND BACK OF THE FURNITURE IS THE SECOND MOST LIKELY PLACE FOR A FIRE TO START, ISN'T THIS A LARGE LOOPHOLE IN THE PROPOSAL?