

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

October 5, 1987

TO : The Commission

Through: Sadye E. Dunn, Secretary *SD*
Leonard DeFiore, Executive Director *LD*

FROM : James V. Lacy, General Counsel *JV*
Stephen Lemberg, Asst. General Counsel *SL*
Harleigh Ewell, Attorney, GC *HE*

SUBJECT: Petition CP 86-2 On Bunk Beds

BALLOT VOTE DUE: **DEC 09 1987**

This vote sheet concerns the Commission decision on whether to grant Petition CP 86-2, from the Consumer Federation of America, that asks the Commission to issue a mandatory standard addressing hazards associated with bunk beds.

Please indicate your vote on the following options.

I. GRANT THE PETITION (staff will prepare an advance notice of proposed rulemaking for the Commission's consideration).

(Signature)

(Date)

II. DENY THE PETITION (staff will prepare a draft letter of denial for the Commission's consideration).

(Signature)

(Date)

III. OTHER (please specify).

(Signature)

(Date)

Comments/Instructions:

661 ac TMA 10/6

DEC 2 1987

TS-1

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(Signature)

(Date)

III. OTHER (please specify). (See attachments.)

Anna de Sene

(Signature)

12/16/87

(Date)

Comments/Instructions:

661 OK TADA 10/6

BUNK BED BALLOT

3. Other

- Send attached letter and staff recommendations to American Furniture Manufacturers Association, requesting response within 45 days
- Review response, then reschedule vote to grant or deny petition

UNITED STATES GOVERNMENT
MEMORANDUM

05D-1
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(Signature)

(Date)

III. OTHER (please specify).

Carol G. Dawson

(Signature)

12/17/87

(Date)

Comments/Instructions:

1. Send attached letter and staff recommendations to American Furniture Manufacturers Association, requesting response within 45 days.
2. Review response, then reschedule vote to grant or deny petition.

661 cc TDA 10/6

Memorandum

RECEIVED-OFFICE OF THE SECRETARY
OF THE SECRETARY
WASHINGTON, D.C. 20207

87 OCT -2 P3:57 OCT 01 1987

TO : The Commission
THROUGH: Sadye E. Dunn, Secretary
THROUGH: James Lacy, General Counsel
THROUGH: Leonard DeFiore, Executive Director
THROUGH: Robert Verhalen, Dr.PH, Acting Director, Office of
Program Management and Budget

FROM : David W. Thome, Acting Program Manager, Emerging Hazards

SUBJECT: Bunk Beds: Resource Estimates for Development of Mandatory
Safety Regulations

The members of the Children's and Recreational Products Program Team estimate that approximately 37 professional staff months would be needed to develop and issue mandatory safety regulations for Bunk Beds. They estimate that this would take approximately 2½ years. Therefore, the resource estimates on a yearly basis would be:

FY 1988 - 15 professional staff months
FY 1989 - 15 professional staff months
FY 1990 - 7 professional staff months

We are providing these estimates to aid in the Commission's consideration of the Consumer Federation of America's Petition (CP86-2) to establish mandatory safety standards for bunk beds.

NOTE: This document has not been re-
viewed or accepted by the Commission.
Initial DT Date 10/1/87

CPSA 6 (b)(1) Cleared

No Mfrs/Prvils/Blrs on

Products Identified

Excepted by

Firms Notified

Comments Processed

Memorandum

RECEIVED-OFFICE OF THE SECRETARY
U.S. CONSUMER PRODUCT SAFETY COMMISSION
WASHINGTON, D.C. 20207

'87 OCT -2 P3 57

OCT 01 1987

TO : The Commission
THROUGH: Sadye E. Dunn, Secretary
THROUGH: James Lacy, General Counsel
THROUGH: Leonard DeFiore, Executive Director
THROUGH: Robert Verhalen, Dr. Ph, Acting Director Office of Program Management and Budget
THROUGH: Carl Blechschmidt, Program Manager, Children's and Recreational Products, Office of Program Management and Budget *cwb*

FROM : *DWT* David W. Thome, Acting Program Manager, Emerging Hazards, Office of Program Management

SUBJECT: Petition CP 86-2 on Bunk Beds

ISSUE

Whether to grant or deny a petition (Tab A) submitted by the Consumer Federation of America (CFA) which requests that the Commission issue a Consumer Product Safety Standard for bunk beds.

The Directorates for Compliance and Administrative Litigation, Economic Analysis, Engineering Sciences, Epidemiology, Field Operations and Health Sciences; and the Offices of Information and Public Affairs, Planning and Evaluation, and Program Management and Budget have reviewed this package and approve its contents. Please note that the information in Attachment 9 of Tab C is marked RESTRICTED and should be handled accordingly.

Pursuant to Section 5 of the Commission General Policies of March 18, 1987, the Executive Director indicates that he is reasonably unaware of any relevant and significant minority or dissenting views on this issue except for those contained in this package, if any.

BACKGROUND

In 1985 and 1986, the Consumer Product Safety Commission (CPSC) staff worked with the American Furniture Manufacturers Association (AFMA) and the Inter-Industry Bunk Bed Committee (IIBBC) to revise the "Voluntary Bunk Bed Safety Guidelines" which had originally been developed by the industry in 1979. After the revised guidelines were completed in May 1986, the staff prepared comments on them. Then on August 26, 1986, the Consumer Federation of America filed a petition which requested that the Commission promulgate mandatory safety regulations for bunk beds.

CPSA 6 (b)(1) Cleared

RESTRICTION REMOVED

NOTE: This document has not been reviewed or accepted by the Commission.

10/1/87
No Mfrs/Prvt Birs on

Products Identified

Excepted by *Ref. p. 13*

Available for Public Release

By *TSP* Date *10/1/87*

ATTACHMENT 9
AMENDED

Initial *AK* Date *10/1/87*

In its petition, CFA cited three different risks of injury posed by bunk beds; inadequate mattress supports which can allow the mattress to fall to the bunk below or to the floor, entrapment in the space between the guardrails and the mattress and entrapment between the bed and the wall. CFA alleges that the voluntary guidelines do not fully address the hazards posed to consumers and therefore believes that the Commission should initiate rulemaking. A letter from AFMA dated August 29, 1987 commenting on the CFA petition is Tab B.

A discussion paper (Memorandum from Elaine Tyrrell to David W. Thome dated Sept. 10, 1987) containing the Children's and Recreational Products Program Team's comments on the Guidelines (Tab C) fully explores the safety issues involving bunk beds and the extent to which the guidelines do or do not address these concerns. Many of these comments were discussed with the IIBCC during the development of the Guidelines; but the staff's comments on the final version of the Guidelines have not been transmitted to the IIBCC nor have they previously been forwarded to the Commission.

This cover memorandum discusses the specific questions which the Commission must consider in determining whether to grant or deny this petition and makes reference to the information and analysis in the Guidelines Discussion Paper as needed.

LEGAL GUIDANCE: ISSUES TO BE CONSIDERED

The Office of the General Counsel (OGC) has provided legal guidance for consideration of this petition.

If bunk beds are determined to be an article intended for use by children, they would be regulated under the provisions of the Federal Hazardous Substances Act (FHSA) for mechanical hazards for children's products, unless the Commission determines that the hazard cannot be reduced to a sufficient extent by action taken under the FHSA or that it is in the public interest to regulate the product under the Consumer Product Safety Act (CPSA). See Section 30(d) of the CPSA, 15 U.S.C. § 2079(d). If bunk beds are determined not to be a children's article, or if the Section 30(d) findings are made, the product would be regulated under Sections 7 and 9 of the CPSA.

The procedure for issuing a product standard under these acts is similar and would begin with an Advance Notice of Proposed Rulemaking (ANPR). In order to issue the standard, the Commission eventually would have to determine that bunk beds present one or more unreasonable risks that would adequately be reduced by the provisions of the standard. OGC states that unreasonable risk has been interpreted as having been shown if the benefits that would result from the regulation have a reasonable relationship to the costs imposed by the regulation. Further, in order to ultimately issue a standard, the Commission would have to find that any applicable voluntary standard that had been adopted by the industry either would not adequately reduce the risk of injury or that it is unlikely that there will be substantial conformance with the voluntary standard. However, it is not

necessary to make a final determination on these issues in order to issue an ANPR. The Commission may grant the petition and issue an ANPR if it concludes that the presently available evidence shows that there may be an unreasonable risk associated with the product and that a product standard may be needed to adequately reduce the risk. Conversely, the Commission may deny the petition if it concludes that the presently available evidence does not establish a substantial likelihood that either there is an unreasonable risk or that a mandatory standard is needed to adequately reduce the risk.

Therefore, the Commission must first consider whether or not there may be an unreasonable risk of injury associated with bunk beds. To assist the Commission in assessing the risks of injury associated with bunk beds, the staff has prepared updated injury information on bunk beds, a market sketch on the bunk bed industry, preliminary information on the costs and benefits of a possible standard dealing with bunk bed entrapment and a summary of Section 15 actions involving bunk beds.

INJURY INFORMATION ON BUNK BEDS

The Directorate for Epidemiology (EP) has provided information on bunk bed injuries in a memorandum dated August 31, 1987 (Tab D).

Based upon the National Electronic Injury Surveillance System (NEISS), EP estimates that there were 30,500 bunk bed related injuries treated in U.S. hospital emergency rooms in 1986. In their petition, the CFA cited the NEISS estimates for years 1979 (18,000 estimated injuries) through 1985 (31,700 injuries) to demonstrate an increase in bunk bed-related injuries in recent years. While there was an apparent increase in estimated injuries, the year-to-year increases among all years were not statistically significant. The role of possible changes in product usage on injury frequency during the 1979-1986 time period is not known at this time.

In 1986, about one-third of the reported victims were under the age of five and about three-fourths were under the age of 15. About two percent of the victims were hospitalized, as compared to about three percent of all injuries reported through NEISS in 1986 indicating that bunk bed-related injuries were less frequently severe than most other product-related injuries. From the one-line descriptive comment that is reported for each injury, almost all of the injuries resulted from victims falling from, bumping into or jumping from bunk beds. Over one-half of these injuries were lacerations, contusions and abrasions. An examination of the data showed similar victim characteristics and hazard patterns during previous years.

CPSC has received reports of 72 bunk bed related deaths (non-fire related) involving children under the age of 15, from 1973 through June 1987. While these deaths do not represent a statistical sample or include all of the bunk-bed related deaths which occurred during this time period, they do indicate how serious incidents occurred during this 14 1/2 year time period.

Entrapment was reported to be associated with 28 deaths. Falls were reported to be involved in 19 deaths; becoming hung by a belt, rope, or clothing in 12 deaths and mattress support failure in 4 deaths.

Entrapment related issues were of particular concern to the petitioner, were the subject of many staff comments on the Bunk Bed Guidelines and were associated with the largest number of fatalities. Therefore, EP reviewed CPSC data bases for additional incidents involving this hazard. Again this is neither a complete count nor a statistical sample of all such cases during the 1973 through June 1987 time period.

The most frequently reported entrapment hazard was entrapment under the guardrail with 54 incidents including 10 deaths. Entrapment between the bed and the wall was the second most frequently reported hazard with 17 incidents and the highest in numbers of deaths reported (15). Entrapment in the end structure of the bed was reported to have been involved in 14 incidents including 2 deaths. Four children became entrapped through the mattress foundation (ie. between the mattress and the bed structure) most likely because of an undersized mattress. One of these incidents resulted in a fatality.

Entrapment has been the most frequently reported cause of bunk bed related deaths since 1973, accounting for 28 of the 72 non-fire related fatalities. If the non-fatal as well as the fatal incidents are considered, the majority of the incidents occurred in the 2-5 years age group, but the majority of deaths (21 of 28) involved children one year of age or less. All entrapment deaths involved children under the age of six. The very young victims (one year of age or less) were the most frequently reported to have died when they became entrapped between the bed and wall.

EP states that in examining these entrapment incidents, it is clear that some of the deaths were bed-related rather than specifically bunk bed-related. For example, in an August 1986 data review for the structural entrapment project, there were 11 deaths reported to CPSC which involved entrapment between a bunk bed and wall and 86 deaths between a regular bed or mattress and the wall. Thus deaths reported from entrapment between bunk beds and walls were about 11 percent (11/97) of the total. With bunk beds being about 10 percent of all household beds in use, the proportion of these reported deaths from entrapment between bunk beds and walls was about the same as the proportion of bunk beds in use.

Of the total deaths reported from all bed entrapment hazards, 22 were with bunk beds and 185 were with other beds. Bunk beds were therefore reported to have been involved in about 10 percent (22/207) of these entrapment deaths, again about the same as their proportion in the total household bed population. From these data, it appears that bunk beds may be no more hazardous than other beds in terms of some entrapment hazards.

OTHER HAZARD RELATED INFORMATION ON BUNK BEDS

In a memorandum dated July 22, 1987 (Tab E), the Directorate for Compliance and Administrative Litigation discussed potential hazards with Bunk Beds.

Prior to 1984, there were two section 15 actions involving bunk beds. In 1984, the staff investigated the death of a two year-old boy due to a bunk bed and mattress support falling on him. The bunk bed's manufacturer and distributor issued a press release and offered consumers a free repair unit. While reviewing CPSC data sources, the CA staff noted a number of other injury patterns, particularly structural entrapment incidents sometimes resulting in suffocation or strangulation. Based upon these observations, CA recommended that an effort be made to initiate a voluntary standard. Subsequent to this recommendation, the staff worked with the Inter Industry Bunk Bed Committee to revise the bunk bed safety guidelines. Following a second death, the bunk bed involved in the incident which spurred this concern was the subject of a stepped up corrective action plan which the CA staff negotiated with the manufacturer and the distributor of the bunk bed.

The staff has since that time investigated 15 different bunk beds with similar mattress support systems. In eight of these cases, the staff determined that corrective action was not needed. In one case the staff requested prospective corrective action. Corrective action such as recall or retrofit has been taken or is being sought in the remaining six files. Since 1983, the CA staff has initiated nine investigations involving entrapment hazards, but has not taken any corrective action.

ECONOMIC INFORMATION

In a Market Sketch dated September, 1986 (Tab F), the Directorate for Economic Analysis (EC) summarized available information on the bunk bed industry. Economics estimates that there are approximately 7-8 million bunk beds in use in households and that annual sales are 450-500,000. EC identified over 70 firms which manufacture bunk beds. Virtually every manufacturer of furniture is a potential manufacturer of bunk beds. The identified manufacturers produce a broader line of furniture and are not substantially dependent on bunk beds. There are possibly hundreds of smaller "garage type" manufacturers of bunk beds producing small numbers of bunk beds each year. Some bunk beds are also imported.

EC has also provided some preliminary information on the potential costs and benefits of an entrapment standard. They estimate that the expected cost of fatal entrapment accidents is about \$2.75 per bunk bed, over the life of the product, for each of the two major entrapment hazards (wall/bed and guardrail/end structure). EC notes that although spacing redesigns to address guardrail/end structure entrapment might be achievable at reasonable cost, the benefits of extra rails to address wall/bed entrapment (which are already available at a cost of \$10-20) may not be reasonably related to costs. (See EC memorandum dated September 23, 1987 also at Tab F)

THE GUIDELINES

If the Commission determines that bunk beds may present an unreasonable risk of injury, it must then consider whether or not the IIBBC Guidelines address the identified risks of injury and whether or not there is likely to

be substantial conformance with the guidelines. The discussion paper at Tab C summarizes the comments of the various CPSC staff members on the adequacy of the various provisions of the guidelines including those which address the risks of injury cited by the petitioner. The discussion paper does not deal with the question of whether or not bunk beds present an unreasonable risk of injury, but only deals with the technical adequacy of the various provisions of the standard as observed by various Commission staff members. In a number of instances, these staff members have pointed out what they believe to be inadequacies and have suggested ways in which some of these provisions might be improved.

OPTIONS

1. Grant the Petition.

The Commission may grant the petition to initiate action towards a mandatory Consumer Product Safety Rule for bunk beds submitted by the Consumer Federation of America if it finds:

- o There may be one or more unreasonable risks of injury associated with bunk beds, and
- o The existing guidelines may not eliminate or adequately reduce the risks of injury associated with bunk beds or sufficient conformance with the guidelines may not occur.

If the Commission votes to grant the petition, the staff will prepare an "Advance Notice of Proposed Rulemaking" (ANPR) for Commission approval and will prepare estimates of the resources needed to pursue the regulatory development process. The Commission should be aware that there is no project for bunk beds in the FY 1987, 88 or 89 operating plan or budget. If the Commission elects to proceed, a project would have to be created and resources reprogrammed from other efforts.

2. Deny the Petition

If the Commission finds that (1) the available information does not establish that there are unreasonable risks of injury associated with bunk beds, or (2) the existing bunk bed guidelines are adequate to eliminate or reduce these risks of injury and substantial conformance is likely; it may deny the petition. The staff would then take no further actions specific to bunk beds. If the Commission votes to deny this petition, the staff will prepare an appropriate letter to the petitioner.

RECOMMENDATIONS

The Directorates for Economic Analysis and Epidemiology and the Office of Program Management and Budget recommend denying this petition. Reasons for this recommendation are given in a joint memorandum from the Associate Executive Directors for Economics and Epidemiology at Tab G and in a memorandum from the Acting Director, Office of Program Management and Budget at Tab H.

The Directorates for Compliance and Administrative Litigation, Engineering, Field Operations, Health Sciences, and the Office of Information and Public Affairs recommend granting the petition. See memoranda from the Associate Executive Director for Engineering. (Tab I), Associate Executive Director for Health Sciences (Tab J), Acting Associate Executive Director for Field Operations (Tab K), the Director, Office of Information and Public Affairs (Tab L) and the Acting Associate Executive Director for Compliance and Administration Litigation (Tab M)

ATTACHMENTS

- Tab A. Letter from Mary Ellen R. Fise, Product Safety Director, Consumer Federation of America with attached Petition to Establish a Mandatory Safety Standard for Bunk Beds (CP86-2) dated August 26, 1986.
- Tab B. Letter from Douglas L. Brackett, Executive Vice President, American Furniture Manufacturers Association to Leonard DeFiore, Executive Director, CPSC dated August 29, 1986.
- Tab C. Memorandum from Elaine Tyrrell, OPMB to David W. Thome, OPMB entitled "Bunk Bed Guidelines" dated September 10, 1987.
- Tab D. Memorandum from Debbie Tinsworth EPHA, to Elaine Tyrrell, EX-PB entitled "Bunk Bed Injury Data" dated August 31, 1987.
- Tab E. Memorandum from Renae Rauchschalbe, CACA to David W. Thome, OPMB entitled "CACA Activities Related to Bunk Beds".
- Tab F. "Market Sketch: Bunk Beds", Terrence R. Karels, Directorate for Economic Analysis, dated September, 1986.
- Memorandum from Dale Ray, Directorate for Economic Analysis, to David W. Thome, OPMB entitled "Bunk Bed Petition: Cost Benefit Issues" dated September 23, 1987.
- Tab G. Memorandum from Paul H. Rubin, AED, Economic Analysis and Robert Frye, Acting AED Epidemiology to Elaine Tyrrell, OPMB entitled "Bunk Beds" dated September 17, 1987.
- Tab H. Memorandum from Robert D. Verhalen, Dr.PH, Acting Director of Office of Program Management and Budget to Elaine A. Tyrrell, Project Manager, OPMB entitled "CFA Petition on Bunk Beds" dated September 17, 1987.
- Tab I. Memorandum from William Walton, AED, Engineering Sciences to Elaine Tyrrell, EX-PB entitled "CP 86-2, CFA Petition on Bunk Beds", dated September 24, 1987.
- Tab J. Memorandum from Andrew Ulsamer, AED, Health Sciences to Elaine A. Tyrrell, OPMB entitled "CP-86-2-Bunk Beds" dated September 24, 1987.
- Tab K. Memorandum from Ross L. Koeser, Acting AED, Field Operations entitled "Bunk Beds Briefing Package" dated September 24, 1987.
- Tab L. Memorandum from David Shiflett, Director, Office of Information and Public Affairs to David Thome, OPMB entitled "Bunk Beds" dated September 22, 1987.

Tab M. Memorandum from Douglas L. Noble, Acting Associate Executive Director for Compliance and Administrative Litigation to David W. Thome, OPMB entitled "CA Recommendation to Grant Petition to Promulgate Mandatory Standards for Bunk Beds" dated September 22, 1987.



Consumer Federation of America

August 26, 1986

Ms. Sadye Dunn
Secretary
U.S. Consumer Product Safety Commission
5401 Westbard Ave.
Room 3027
Bethesda, MD 20207

Dear Ms. Dunn:

Enclosed please find for docketing a petition
concerning the safety of bunk beds.

Sincerely,

Mary Ellen R. Fise
Product Safety Director

MERF/l dg

cc: The Commission
OPM

Enclosure

IN THE UNITED STATES OF AMERICA
BEFORE THE CONSUMER PRODUCT SAFETY COMMISSION

In the Matter of the)
Petition of Consumer)
Federation of America)
to establish a Mandatory)
Safety Standard for)
Bunk Beds)

No. _____

Pursuant to the Administrative Procedures Act, 5 U.S.C. section 553 (e) and regulations of the Consumer Product Safety Commission (CPSC), 16 C.F.R. section 1051, Consumer Federation of America (CFA) hereby petitions CPSC to promulgate a consumer product safety standard for bunk beds under section 7 of the Consumer Product Safety Act, 15 U.S.C. section 2056.

I

INTEREST OF PETITIONER

The Consumer Federation of America (CFA) is the nation's largest consumer advocacy organization representing over 200 organizations and over 30 million consumers. CFA brings this petition on behalf of its members and all consumers who use bunk beds.

II

BUNK BED HAZARDS

The number of bunk bed injuries has increased 75.7% percent in the past six years, from 18,053 in 1979 to 31,727 in 1985 (see chart).

Bunk Bed Injuries*

<u>Year</u>	<u>Number of Injuries</u>
1979	18,053
1980	20,777
1981	22,373
1982	24,292
1983	27,253
1984	28,432
1985	31,727

*These figures are national estimates of injuries associated with bunk bed use which require hospital emergency room treatment.
Source: National Electronic Injury Surveillance System.

In addition there have been 23 deaths or more¹ associated with bunk bed use. These deaths and injuries are the result of a variety of problems, including:

- o Mattress Supports: Where mattress supports are not well secured to the bed frame, such as those that rest on narrow

¹ According to CPSC Hazard Analysis Division, the 23 deaths (cited in a CPSC Memorandum of January 18, 1985 from Jean Kennedy to Elaine Tyrell) do not include all deaths reported to date. Conversation with D. Tinsworth, July 23, 1986.

ledges attached to the side rails, they can easily be dislodged causing the mattress to fall to the bunk below or the floor. At least three persons have died as a result of this danger.

- o Space Between Guardrails and Mattress: Some bunk beds have a space between the lower edge of the guardrails and the top surface of the mattress. Young children can slip through these small openings feet first when their weight presses the mattress down. Their heads can then be caught between the guardrail and the depressed mattress causing strangulation. CPSC has received reports of at least ten deaths as a result of this hazard.
- o Entrapment Between Bed and Wall: Because most bunk beds lack a rail on the wall side, young children can roll into the space between the bed and wall and have their head or chest caught in the space. At least eleven children have died because of this hazard.

CFA contends that these bunk bed hazards pose an unreasonable risk of injury to consumers.

III

ACTION REQUESTED

CFA requests that CPSC promulgate a mandatory safety standard for bunk beds. Such a mandatory standard should address the unreasonable risk of injury posed by those hazards discussed above (see Section II). Specifically, we believe that the standard should contain provisions which include, but are not limited to: fit of the top bed to the bottom bed; mattress and foundation size and fit; support system, side rails and side rail attachments;

guardrails; bed end structure; ladders; labelings and warnings; and instructions.

Under section 7 of the Consumer Product Safety Act (15 U.S.C. section 2056) the Commission may promulgate mandatory safety standards where there is no existing voluntary standard. If there is an existing voluntary standard, the Commission must rely on this standard if it adequately addresses the unreasonable risk of injury posed by the product and there is substantial compliance with the voluntary standard by industry.

In the case of bunk beds, there is no existing voluntary standard.² While the industry has developed a guideline for bunk beds, this document is not a voluntary standard. As the Conference Report to the 1981 Amendments to the Consumer Product Safety Act explains:

The voluntary standards adopted and implemented at the time of the finding are the relevant ones for purposes of this determination. The voluntary consumer product safety standard must be "adopted" in the sense that it has been finally approved in accordance with reasonable procedures, such as those utilized by groups that develop national consensus standards, for the adoption of voluntary consumer product safety standards. (emphasis added.)³

-
- ² American National Standards Institute standard Z357.1 only addresses the size of bedding for bunk beds. It does not address bunk beds furniture safety features. Conversation with Russ Abolt, Secretariat for ANSI Z357.1, National Association of Bedding Manufacturers, August 11, 1986.
- ³ Omnibus Budget Reconciliation Act of 1981, Conference Report, H.R. Rep. No. 97-208, 97th Congress., 1st Sess. 875 (1981).

The Voluntary Bunk Bed Safety Guidelines were developed by an Inter-Industry Bunk Bed Committee⁴ through a process whereby non-industry participation was prohibited. Furthermore, the guidelines developed by industry do not fully address the hazards posed to consumers by bunk bed use. Thus, CFA believes the facts clearly support the initiation of rulemaking to develop a mandatory safety standard for bunk beds.

Respectfully submitted,



Mary Ellen R. Fise
Attorney for Petitioner
Consumer Federation of America
1424 16th Street, N.W. #604
Washington, DC 20036
(202) 387-6121

date submitted: August 27, 1986

⁴ Letter from Douglas L. Brackett, Executive Vice President, American Furniture Manufacturers Association, to Leonard DeFiore, Executive Director, Consumer Product Safety Commission, May 23, 1986.

**American ★ Furniture
Manufacturers Association**
POST OFFICE BOX HP-7 HIGH POINT NORTH CAROLINA 27261 919/884-5000

August 29, 1986

Mr. Leonard DeFiore
Executive Director
U. S. Consumer Product Safety Commission
5401 Westbard Avenue
Bethesda, MD 20207

Dear Mr. DeFiore:

I am writing in response to the August 27, 1986 communication submitted to the Consumer Product Safety Commission (CPSC) by the Consumer Federation of America (CFA). The CFA communication requested the CPSC to promulgate a mandatory safety standard for bunk beds. As you know the Inter-Industry Bunk Bed Standing Committee (IIBBC), in May, 1986, completed a revision of the 1978 Voluntary Industry Bunk Bed Guidelines. Based on reasons set forth below, IIBBC believes the CFA request is without merit.

The Inter-Industry Bunk Bed Committee spent a year-and-a-half revising the 1978 Voluntary Industry Bunk Bed Guidelines. The revision effort was prompted by new data on injuries associated with bunk beds. The IIBBC is a national group composed of furniture manufacturers, furniture retailers, and trade association representatives. The IIBBC has acted in a responsible, pro-active, and expeditious manner in developing the Voluntary Bunk Bed Safety Guidelines. As a result, virtually all bunk bed components will be changed in terms of complying with the new guidelines.

CFA asserts that the May, 1986 Voluntary Bunk Bed Guidelines are not satisfactory on three counts: first, that they fail to fully address hazards posed to consumers; second, that they were not adopted by "groups that develop national consensus standards"; and third, that the process prohibited non-industry participation.

On the question of addressing the hazards, we strongly feel that the May, 1986 voluntary guidelines more than adequately address the issue of unreasonable risk of injury. Specifically, with regard to the areas CFA feels a standard ought to cover:

(1) **FIT OF THE TOP BED TO THE BOTTOM BED.** The new guidelines (Section 3.2) require a fastening mechanism to prevent disengagement, or a design which requires a minimum lift of 1.25 inches for horizontal disengagement.

(2) **MATTRESS AND FOUNDATION SIZE AND FIT.** The new guidelines (Section 3.3) require inclusion of specifications as to width, length and thickness of the mattress and foundation to be used with the particular bunk bed. As CFA is undoubtedly aware, bunk beds are sold separate and apart from mattresses.

(3) **SUPPORT SYSTEM.** The new guidelines (Section 3.41) require a support system which PROHIBITS the mattress and foundation from falling into the clearance over the lower bunk or to the floor. In addition, the guidelines require that the support system not be capable of being dislodged without the release of positive fastening devices or the use of hand tools.

(4) **SIDE RAILS AND SIDE RAIL ATTACHMENTS.** The new guidelines (Sections 3.42, 3.43, 3.44) require bolted side rails to be secured at each end by two bolts, with no more than 1/4 inch of thread (bolt head) exposed. Hook-on rails must be securely attached to the bed post and require an additional action other than upwards force to disengage. In addition, rails must support a downward vertical force of 225 lbf (pound-force) load applied for 30 seconds to the side rails, 10 inches from the end, without structural failure.

(5) **GUARDRAILS.** The new guidelines (Section 3.5) require that guardrails be attached to require the intentional release of a fastening device or be designed to require sequential forces in different directions for removal. Other requirements pertain to openings between the guardrail and the mattress, the guardrail and the rigid bed structure, and providing an optional second guardrail (at the consumer's choice).

(6) **BED END STRUCTURE.** The new guidelines (Section 3.6) require design of bed end structures so that at least 50% of the distance between the two posts of the upper bunk are at least five inches above the sleeping surface, and so that no opening occurs which permits the passage of a cube that is larger than 3½" and less than 8" — to minimize the chance of entrapment.

(7) **LADDERS.** The new guidelines (Section 3.7) require design of ladder brackets to prevent inadvertent disengagement, repositioning or tilting while in use.

(8) **LABELINGS AND WARNINGS.** The new guidelines (Section 3.8) require the permanent attachment of a cautioning label (below) to a bed end structure of the top bunk.

CAUTION

Guardrail mattress position and size are important.

Follow written instructions with this bed.

If not against wall, use two guardrails.

Prohibit children under 6 years on top bunk.

Always use guardrail and ladder.

Ensure all connectors are tight.

Prohibit horseplay on or under bed.

DO NOT REMOVE THIS LABEL

(9) **INSTRUCTIONS.** The new guidelines (Section 3.9) require that written instructions accompany each bunk bed, including, at a minimum, a parts list, instructions for assembly, size of mattress and foundation, other parts, and **SAFETY PRECAUTIONS.**

Mr. Leonard DeFiore

August 29, 1986

Page Three

With regard to the development of voluntary standards by groups that develop national consensus standards, legislative intent (found in the Conference Report of the 1981 Amendments to the Consumer Product Safety Act) is quite clear:

"The voluntary standards adopted and implemented at the time of the finding are the relevant ones for purposes of this determination. The voluntary consumer product safety standard must be 'adopted' in the sense that it has been finally approved in accordance with reasonable procedures, SUCH AS those utilized by groups that develop national consensus standards, for the adoption of voluntary consumer product safety standards."

The mention of national consensus standards developing groups is added merely as an example. Certainly, the conference report language was not meant to limit the development of national voluntary standards solely to those groups.

The process by which the May, 1986 revised bunk bed guidelines were developed was exemplary, and involved, in open discussion, all parties evidencing an interest in the subject. The effort actually dates back to 1984, when the CPSC's emerging hazards program expressed concern over new injury data related to bunk beds. In January, 1985 the IIBBC was reconstituted and first met in March, 1985 to begin revising the existing guidelines.

Meanwhile, in April, 1985, the CPSC issued a Safety Alert warning of dangers associated with bunk beds, and approximately 6000 copies of the Safety Alert were distributed to a number of groups, including CONSUMER GROUPS.

In August, 1985 IIBBC member representatives met with key CPSC staff to discuss the IIBBC's draft revised guidelines. In December, 1985 representatives of the IIBBC met with CPSC staff to receive their suggestions. The process was continued with a January, 1986 meeting between CPSC staff and the IIBBC, and the final guidelines were transmitted to the CPSC on May 23, 1986.

In addition, CFA, when it quoted the Conference Report, failed to provide the full language relating to acceptable voluntary standards. The quote provided by the CFA continues with

"The standard must be 'implemented' in the sense that substantial industry-wide production of products that comply with the standard has begun."

CPSC staff visited showrooms at the High Point, North Carolina market in April, 1986 prior to the finalization of the guidelines, and certainly prior to any public announcement of the guidelines. The CPSC log of that visit clearly reflects that bunk bed manufacturers had already begun to incorporate suggested design modifications into their finished products.

Mr. Leonard DeFiore
August 29, 1986
Page Four

With regard to the CFA accusation that "non-industry participation was prohibited": this is obviously untrue since the CPSC was intimately involved. In addition, every joint meeting was announced in the CPSC's Public Calendar well in advance, and were open to outside attendees. Not only did CFA not attend any of these meetings, they also failed to even offer any input during the year-and-a-half guideline development process -- despite adequate public notice to the effort. The CPSC Public Calendar announcements are attached for your review.

CFA correctly notes that the CPSC has the discretionary authority to issue mandatory safety standards where there is no existing voluntary standard. However, CFA failed to note a number of statutory requirements limiting the CPSC's discretion, among them that the CPSC must rely upon any voluntary standard if it adequately addresses unreasonable risk of injury and there is substantial compliance with the standard in the industry.

All in all, the year-and-a-half effort featured a high degree of cooperation between the CPSC and the IIBBC, and the final product reflects a solid mixture of perspectives and expertise. We fully expect to cooperate with the CPSC on this issue in the future, as the IIBBC is a STANDING COMMITTEE. Since, as noted previously, the IIBBC is a national group and the development of the guidelines involved all other parties showing an interest, we feel strongly that the Inter-Industry Bunk Bed Guidelines will achieve a high degree of compliance.

An accurate measure of compliance with the guidelines will have to await the scheduled full implementation date of April, 1987. However, the fact that approximately 75-80% of the U. S. bunk bed production is represented on the IIBBC, a prediction of substantial compliance being achievable is well within reason. Furthermore, the IIBBC is committed to publicizing the guidelines and, in fact, has already begun that task.

Cordially,


Douglas L. Brackett
Executive Vice President

cc: Douglas Noble

Memorandum

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

SEP 10 1987

TO : David W. Thome, Acting Program Manager, Emerging Hazards

FROM : Elaine A. Tyrrell, Project Manager, Children's and
Recreational Products Program, Office of Program Management

SUBJECT: Bunk Bed Guidelines

Issue

To provide the Children's and Recreational Products Program Team's comments on the "Voluntary Bunk Bed Safety Guidelines", dated May 23, 1986, that were transmitted to the Executive Director by the American Furniture Manufacturers Association (AFMA) with a cover letter dated August 7, 1986 (Attachment 1). The Guidelines are considered by AFMA to be final. These staff comments will provide background for the Commission's consideration of the Consumer Federation of America's petition to establish a mandatory safety standard for bunk beds.

Background

Bunk Bed Safety Guidelines were first developed by the Industry in 1979 and were included in the American National Standard for Bedding Products and Components (ANSI Z357.1) in 1981. These Guidelines were revised and updated by a committee convened by AFMA, the Inter-Industry Bunk Bed Committee (IIBBC). The "Voluntary Bunk Bed Safety Guidelines", dated May 23, 1986, represent the results of that effort.

AFMA revised and updated the Guidelines in response to a request from the Commission staff to address three hazards identified as being associated with bunk beds that had resulted in deaths. These were: failure of the mattress support system, entrapment between the mattress and guardrail, and entrapment between the bed and wall. Because of the seriousness and unforeseen nature of these hazards, the Commission issued a Safety Alert, dated March 1985, and a news release, dated April 8, 1985, both of which warned consumers of the hazards and suggested ways of avoiding them with existing bunk beds (Attachment 2). In addition, the staff and Douglas Noble, the Voluntary Standards Coordinator at that time, worked with AFMA and urged the adoption of measures to address these hazards for future production of bunk beds.

During the development of the revised Guidelines, staff identified additional hazard patterns associated with bunk beds based on a closer examination of the available injury data. These hazard patterns (entrapment between the mattress and bed structure, and entrapment/falls associated with certain end structures) were in addition to those listed above that initiated the project. The staff considers the provisions in the Guidelines addressing the five identified hazard patterns as being the most critical.

Staff members of the Children's and Recreational Products Program (CRPP) reviewed two preliminary drafts of the Guidelines and met with AFMA to discuss staff comments on August 21, 1985, and December 19, 1985. In addition, they met with IIBBC on January 30, 1986, to exchange views directly with the bunk bed manufacturers. After the January 1986 meeting, the staff submitted a redrafted version of the Guidelines to AFMA. This redraft contained changes which had been agreed upon at the January 1986 meeting and new language for several provisions which IIBBC had asked the staff to provide. Attachment 3 contains a historical record of the staff comments on preliminary drafts and other correspondence between the staff and AFMA during development of the Guidelines.

The CRPP staff also reviewed the final version of the Bunk Bed Safety Guidelines dated May 23, 1986. The CRPP staff's point-by-point comments on the Guidelines are at Attachment 4. Their comments are also incorporated in the table at Attachment 5 which compares the provisions of the final (1986) version of the Guidelines with the provisions of the original 1979 version of the Guidelines and provisions for bunk beds in the 1981 ANSI Standard Z357.1. Provisions for the five hazard patterns which the staff identified as being most critical are noted in Attachments 4 and 5 with an asterisk by the Guidelines paragraph number and staff comments column, respectively.

Discussion

Evaluation of Provisions

The remarks below cover the major issues related to the 5 hazard patterns which the staff asked AFMA to address and which the staff believes to be most critical. The paragraph citations refer to those in the May 25, 1986, Guidelines.

1. Failure of the Mattress Support System (§3.4.1)

The CRPP staff believes that the provision in the Guidelines which addresses the hazard pattern that initiated the project (failure of the mattress support system) is adequate. This provision, in conjunction with the Commission's I&E efforts (Safety Alert, News Release, the revised and updated Fact Sheet, and coverage in various press conferences directed at children's products) should address the hazard, both on a retrospective and prospective basis.

2. Entrapment Between the Mattress and Guardrail (§3.5.4 and §3.8.2)

The staff is aware of at least 54 incidents, including 10 deaths, of entrapment between the mattress and guardrail since 1973.

The Guidelines contain two alternative provisions to address this entrapment hazard. The CRPP staff believes that the first alternative, specifying a maximum opening between rigid bed structures and guardrail, is adequate ("there shall be no openings in the rigid bed structure below the lower edge of the guardrail that would permit the free passage of a 3½-inch cube in any orientation---"). However, the majority of the CRPP staff does not think the second alternative, specifying a maximum opening between the mattress and guardrail, is adequate ("--- or the lower edge of the guardrail shall not be more than 1 inch from the mattress").

There are four reasons for their objections: 1) if bunk bed manufacturers do not supply mattresses with their beds, they cannot control mattress thickness/compressibility (at the January 30, 1986, meeting with the IIBBC, the staff was told that mattress thickness can vary from 2 to 9 inches), 2) a mattress supplied by the manufacturer that complies with the 1-inch space provision, uncompressed, may create a hazardous opening when compressed under the weight of a child, 3) deteriorating mattresses may become more compressible, and 4) consumers purchasing second-hand bunk beds or consumers with older bunk beds may replace the mattresses. Since there is no provision for a label on the bed with mattress size/fit requirements, and the instructions (which include mattress/foundation size) may be lost, the replacement mattress may be smaller in length, width, and thickness than the mattresses the bunk bed manufacturer intended for use on the bed.

In addition, the Guidelines contain a provision for a "Caution" label which attempts to address this hazard by stating "guardrail/mattress position and size are important." Since entrapment between mattress and guardrail can, but does not always, result in death, the proper signal word for the label is "Warning". "Caution" is only used when minor injury may result. "Danger" is only used if death will result. If there is a probability of death, "Warning" is the proper signal word.

3. Entrapment Between Bed and Wall (§3.8.2 and §3.9, 5(h))

Given industry's position that the top bunk is designed for use by children over the age of six, the CRPP staff believes that the sentence in the Instructions at 5(h) is adequate to address the problem of older children falling from the top bunk. However, through the available incident data, staff is aware of the practice of placing children younger than six years either in the lower bunk or in a bunk bed used in the twin configuration, with no guardrails or with only a guardrail on the side away from the wall

when they have outgrown a crib. Staff is aware of at least 15 children who have died when they rolled between the bunk bed and the wall. Therefore, the majority of the CRPP staff believes that an additional sentence should be added recommending that when the bed is used as a child's first regular bed, a second guardrail be used between the bed and wall.

In addition, the label at ¶3.8.2, stating that "If not against wall, use two guardrails", gives a false sense of security that if the bed is against the wall, a second guardrail is not needed. At a minimum, this language should be consistent with that in the Instructions by modifying it to read "If upper bunk is not against wall, use two guardrails." Second, a sentence recommending use of a second guardrail between the bed and wall when the bed is used as a child's first bed (similar to that recommended for the Instructions) should be added to the label.

4. Entrapment Between the Mattress and Bed Structure (¶3.3 and ¶3.9,3)

The staff has identified four cases (including one death) where entrapment occurred in spaces between the mattress and bed structure.

Paragraph 3.3 in the Guidelines states that the manufacturer shall include mattress width, length, and thickness specifications in the written Instructions (that is specified in ¶3.9,3). The majority of the CRPP staff believes that this is inadequate for two reasons. First, although mattress widths and lengths are standardized, mattresses come in two lengths: "regular" - 74½ inches and "extra long" - 79½ inches. Without a permanent label on the bed, consumers may purchase the incorrect length mattress for their bed structure. The staff has reports of entrapment incidents between the mattress and end structure where the mattress was of regular length and the bed structure was of extra long length. Second, without a provision specifying a maximum dimension between the bed structure and the mattress, a large space between bed structure and mattress may occur. The majority of the CRPP staff believes that the Guidelines should specify that the interior size of the bed structure should not be more than 1½ inches greater than the nominal size of the mattress.

5. Entrapment/Falls Associated with Certain End Structures of Upper Bunk Beds (¶3.6.2)

The staff is aware of at least 14 cases of entrapment, including two deaths, in bunk bed end structures.

In the Guidelines it states that there shall be no openings in the end structures of the upper bunk that would allow free passage of a cube of any dimension between 3½ and 8 inches in any

orientation when the mattress and foundation are in place. Such wording would permit openings of up to $3\frac{1}{2}$ inches above the mattress surface. Mattress compressibility could result in an opening even greater than $3\frac{1}{2}$ inches which could present an entrapment hazard. Furthermore, an opening in the end structure capable of permitting free passage of an 8-inch cube could increase the likelihood that a child could fall from the top bunk, since a child could pass through an opening of this size.

In summary, the staff believes that one of the 5 hazard patterns is adequately addressed by the Guidelines. To address the other four hazard patterns, the majority of the CRPP staff believes that, at a minimum, the provisions in the Guidelines should be modified as follows:

ENTRAPMENT HAZARD

PROVISION

Mattress & Guardrail

¶3.5.4 Delete: "... or the lower edge of the guardrail shall not be more than 1 inch from the mattress."

¶3.8.2 Add a second permanent label which specifies mattress size and fit.

Bed & Wall

¶3.8.2 To the Label, a) Change Signal word to: "Warning"; b) modify sentence to read: "If upper bunk not against wall, use two guardrails."; and c) Add: "When bed, other than upper bunk, is used as child's first regular bed, use second guardrail between bed and wall."

¶3.9.5(h) To the Instructions add the following: "Use two guardrails when the bed, in the twin configuration or as a lower bunk, is to be used as a child's first regular bed. Even when the bed is pushed against a wall, a young child may roll between the bed and wall resulting in entrapment and possible suffocation."

Mattress & Bed Structure

¶3.3 Add: "The interior size of the bed structure shall not be more than $1\frac{1}{2}$ inches greater than the nominal size of the mattress."

End Structure

¶3.6.2 Modify to read: "There shall be no openings in the rigid end structure of the upper bunk that would permit the free passage of a $3\frac{1}{2}$ -inch cube in any orientation."

The majority of the CRPP staff believes that the comments on the Guidelines should be forwarded to the IIBBC for consideration.

Likelihood of Conformance

The staff has not conducted a survey of the bunk bed industry to determine the level of conformance with the guidelines which were published in May 1986 and became effective in April 1987.

In a letter dated July 15, 1987 (Attachment 8), the American Furniture Manufacturers Association provided answers to staff questions about the industry, the dissemination of the Guidelines, and the estimated level of conformance.

- o AFMA stated that of the 39 bunk bed manufacturers identified in the 1982 Census of Manufacturers, 32 are estimated to be AFMA members. (The CPSC Economics Directorate has identified over 70 manufacturers of bunk beds including small firms not identified in census data.)
- o The staff asked what steps AFMA had taken to disseminate the Guidelines. AFMA replied that it disseminates bunk bed press releases to the national press, the furniture trade press and consumer shelter publications. AFMA also provides notices to its member companies.
- o AFMA estimates that in excess of 90% of the bunk beds now being produced for sale in the U.S. are in conformance with the guidelines.

In April 1987, an AFMA representative accompanied the Commission's Charlotte, North Carolina resident investigator on a tour of the displays of six manufacturers who were showing their products at the 1987 Southern Furniture Market Show. All six appeared to be in conformance to the guidelines. (See Attachment 9 RESTRICTED)

Additional information would be necessary to determine "substantial" conformance.

To achieve wide-spread recognition of the bunk bed safety problems and better adherence to the measures developed to reduce the hazards, the majority of the staff believes that the Guidelines should be submitted to a nationally and internationally recognized voluntary standards organization where they can be developed as a voluntary standard through a consensus process. Through such a process, the expertise of all interested parties (manufacturers, retailers, consumers, and government representatives) would result in a more

credible and technically sound document. In addition, it follows that the more parties that participate in the development of the document, the more thorough the understanding of the rationale for the provisions of such a voluntary standard and the wider the acceptance and conformance to the provisions of the resulting voluntary standard.

Of further benefit to both industry and consumers is that through a recognized voluntary standards organization, the mechanism exists for a review/update of a voluntary standard when necessary to reflect current technology or state-of-the-art, which may have contributed to new hazard patterns. Also, of benefit to industry and consumers is the fact that liability rests with the voluntary standards organization, not the individual members (Attachment 6).

In addition, a third party certification program established for a bunk bed voluntary standard would help promote compliance by importers, distributors, and small domestic firms who may not have been involved in the voluntary standard development. A certification program would further promote conformance with the provisions of such a standard since manufacturers would have to have their beds certified by a third party as complying with the safety provisions of the voluntary standard before making claims to that effect. In correspondence with the National Association of Bedding Manufacturers (NABM), dated February 20, 1985, (Attachment 7), the staff noted what appeared to be a lack of industry conformance with many of the provisions of the old Guidelines in ANSI Z357.1 (staff is aware of at least one distributor who claimed conformance with the old Guidelines but his products did not conform to several major provisions). A program that would certify conformance with a voluntary standard such as is in effect for four juvenile products (high chairs, play yards, strollers/carriages, and walkers) would ensure conformance to all provisions. Such a program would enable consumers to identify products that comply with the voluntary standard through the use of a label or hang tag (such as those used by the Juvenile Products Manufacturers Association in their certification programs).

Staff Conclusion & Recommendation

Based on the above discussion and conclusions, a majority of the CRPP staff recommends that at a minimum, 1) that the staff's comments on the Guidelines be forwarded to AFMA with the recommendation that they be adopted, 2) that the Bunk Bed Guidelines be referred to a voluntary standards writing organization, such as ASTM or to a certified canvass sponsor organization under the auspices of the American National Standards Institute (ANSI), where it can be developed as a voluntary safety standard using the consensus process (manufacturers, retailers, consumers, and government representatives), and 3) that a certification program be established.

ATTACHMENTS

- Attachment 1 Letter from Douglas Brackett, Executive Vice President, AFMA, to Leonard DeFiore, Executive Director, CPSC, dated May 23, 1986.
- Attachment: "Voluntary Bunk Bed Safety Guidelines", May 23, 1986.
- Attachment 2 Consumer Product Safety Alert, "CPSC Warns Consumers of Bunk Bed Hazards", March 1985.
- CPSC News Release, "CPSC Warns of Bunk Beds Dangers", April 8, 1985.
- Attachment 3 Memorandum from Preston, J.D., ESMT, and Deppa, S.W., ESHF, to Tyrrell, E.A., OPM, entitled, "Comments on Revised Voluntary Bunk Bed Safety Guidelines", December 16, 1986.
- Memorandum from Preston, J., ESMT and Deppa, SW, ESHF to Fairall, P., EX-P entitled "Rationale for CPSC Staff Suggested Requirements for Bunk Bed Guardrails and End Structures."
- Letter from Patricia Fairall, OPM, to Joseph Ziolkowski, Director of Technical Services, AFMA, dated February 11, 1986.
- Memorandum from Preston, J.D., ESMT, and Deppa, S.W., ESHF, to Fairall, P., EX-P, entitled, "Voluntary Bunk Bed Safety Guidelines", February 11, 1986.
- CPSC staff handout for Bunk Bed Meeting of 1/30/86:
- Attachment 1. Entrapment in Openings Bounded on Both Sides by End Structures.
- Attachment 2. Feet First Entrapment Between End Structure and Mattress.
- Attachment 4 Staff Comments on May 23, 1986, Bunk Bed Guidelines.
- Attachment 5 Chart entitled, "Summary of Provisions and CPSC Staff Comments to 1986 Final Bunk Bed Safety Guidelines".
- Attachment 6 ASTM Standardization News, June 1986, pp. 18-19.
- Attachment 7 Letter from Elaine Tyrrell, OPM, to Pat Lortz, NABM, dated February 20, 1985.
- Attachment: Memorandum from Preston, J., ESMT, to Tyrrell, E., EX-P, entitled, "Voluntary Standard for Bedding Products and Components, ANSI Z357.01 - 1981", February 4, 1985.

Attachment 8 Letter from Josphe G. Gerand, Vice President American Furniture Manufactures Association to Elaine A. Tyrell, OPMB dated July 15, 1987.

Attachment 9 Memorandum from Allen Dobbins, CPSC Charlotte, North Carolina Resident Post to George Lester SPSI and Shelly Deppa EPHF entitled "Bunk Bed Examination at Southern Furniture Marcket Show High Point, North Carolina" dated May 5, 1987. ~~(RESTRICTED)~~

**American Furniture
Manufacturers Association**
POST OFFICE BOX HP-7 HIGH POINT NORTH CAROLINA 27261 919/884-5000

August 7, 1986

Mr. Leonard DeFiore
Executive Director
U. S. Consumer Product Safety Commission
5401 Westbard Avenue
Bethesda, MD 20207

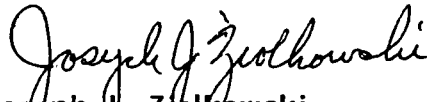
Dear Leonard:

Enclosed for your information is a copy of the bunk bed guidelines and the cover letter that was distributed to bunk bed manufacturers throughout the United States.

We are also in the process of issuing press releases which will announce the action of the committee.

If you have any question, please contact me at your convenience.

Best regards,



Joseph J. Ziolkowski
Director of Technical Services

JJZ/rsm

**American ★ Furniture
Manufacturers Association**
POST OFFICE BOX HP-7 HIGH POINT NORTH CAROLINA 27261 919/884-5000

VOLUNTARY BUNK BED SAFETY GUIDELINES FINALIZED

After many months of deliberations, the Inter-Industry Bunk Bed Committee has finalized the revision of the Voluntary Bunk Bed Guidelines originally developed by the Committee in 1978.

The guidelines incorporate revised construction and labeling requirements for bunk beds. Enclosed is a copy of the guidelines.

Target dates adopted by the Inter-Industry Bunk Bed Committee for the implementation of the guidelines are as follows:

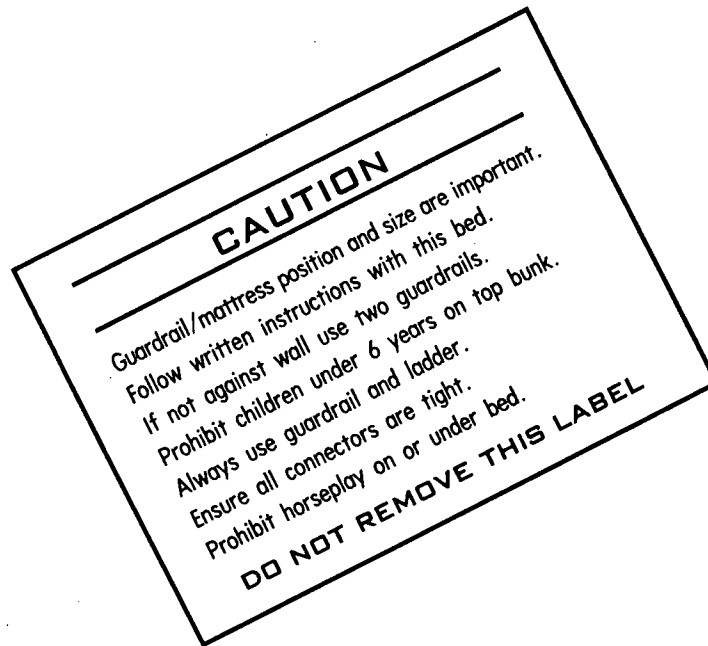
By the October, 1986 Southern Furniture Market, manufacturers should begin to incorporate the guidelines and by the April, 1987 Southern Furniture Market, all products should be in conformity.

To assist furniture manufacturers in obtaining the caution label, AFMA has made arrangements with a printer to supply the labels at a reduced rate. Enclosed is an order form for these labels.

If you have any questions, please contact Joe Ziolkowski at 919-884-5000. Additional copies of the guidelines are also available at a nominal cost.

JJZ/rsm

Voluntary Bunk Bed Safety Guidelines



Published by
American Furniture Manufacturers Association

VOLUNTARY BUNK BED SAFETY GUIDELINES

May 23, 1986

INTRODUCTION

The purpose of this voluntary product guideline is to establish Nationally recognized safety requirements for Bunk Beds and to provide a basis for common understanding as to the safe use of bunk beds among producers, distributors, and users.

It is felt that voluntary use of guidelines by the industry and users will effectively address the preventable injuries associated with bunk beds.

1. Scope

1.1 This voluntary guideline establishes minimum construction and labeling requirements for bunk beds.

1.2 This voluntary guideline is intended to minimize accidents to children resulting from normal use.

1.3 For purposes of these voluntary guidelines, a bunk bed is defined as a set of components which may be assembled as sleeping units, one stacked over the other, or any bed in which the underside of the foundation is over 35 inches from the floor.

1.4 No bunk bed may indicate compliance with the guidelines unless it conforms to all requirements contained herein.

1.5 These voluntary guidelines have been prepared by a Voluntary Inter-Industry Bunk Bed Standing Committee.

2. Definitions

For the purposes of this standard, the following definitions shall apply:

2.1 **Bed End Structures**—an upright unit at the head and foot of the bed, to which the side rails attach.

2.2 **Foundation**—the base or support for a mattress. The foundation may be independent from or incorporated with the sleeping surface by means of fabric cover. The foundation is typically a rigid lattice, fabricated from wood, plastic, or other materials, covered with rigid or semi-rigid material to provide uniform support for the mattress.

2.3 **Guardrail**—a rail to help prevent a sleeping occupant from rolling or sliding out of the bed.

2.4 **Mattress**—a manufactured product intended to be slept on, consisting of various resilient materials covered with an outer ticking.

2.5 **Side Rail**—the rail attached to a headboard and footboard to which the foundation support system is fastened.

3. General Requirements

3.1 All finishes and materials used in the construction of products covered under these voluntary guidelines must be nonhazardous as defined by the Federal Hazardous Substances Act Regulations as they may exist at the time the products are introduced into interstate commerce. Federal Regulation 16 CFR Section 1500.49 (sharp edge), 16 CFR Section 1500.48 (sharp points), 16 CFR Part 1501 (small parts), and 16 CFR Part 1303 (lead-containing paints) are in effect and are administered by the Consumer Product Safety Commission. These Federal Regulations itemized above are not part of these voluntary guidelines. This information is offered to all parties so that they know that these Federal Regulations must be adhered to outside of the scope of these voluntary guidelines.

3.2 Fit Of Top Bed To Bottom Bed—the bed post shall be designed so the minimum height of lift to allow horizontal disengagement of the top bed from the bottom bed shall be 1.25 inches or a fastening mechanism may be used which will prevent the disengagement of the top bed from the bottom bed.

3.3 Mattress And Foundation Size And Fit—pursuant to the provisions of 3.9 "Instructional Literature" the manufacturer shall include in the Instructional Literature specifications as to the width, length and thickness of the mattress and foundation that must be used with the particular bunk bed to which the Instructional Literature relates.

3.4 Support System, Side Rails and Side Rail Attachments.

3.4.1 Support System—the support system shall confine the horizontal position of the mattress and the foundation and shall prohibit the mattress and foundation from falling into the clearance over the lower bunk or to the floor when the mattress or foundation is manipulated. The support system shall not be capable of being dislodged without the release of positive fastening devices or the use of hand tools. In the event cross members are utilized, a minimum of two per bed are required.

3.4.2 Bolt-On Side Rails—bolt on rails that attach at their ends or on their side to the bed post shall be secured at each end by two bolts with a minimum size of ¼ inch diameter, spaced a minimum of 1.5 inches apart on their centers. When the bolts are fully tightened in the assembled bed, no more than ¼ inch of thread shall be exposed.

3.4.3 Hook-On Side Rails—hook on side rails shall be securely attached to the bed post. Hook-on attachments shall require an additional action other than an upwards force to disengage.

3.4.4 Bolt-On, hook-on or any other post to bed side rail fastening systems shall support a downward vertical 225 lbf (pounds force) load applied for 30 seconds to the side rail, 10 inches from the bed ends, to be done successively at each corner of the bed, without structural failure.

3.5 Guard

3.5.1 A guardrail shall be provided on all four sides of the foundation unless the foundation is a single piece and the guardrail is a separate piece.

3.5.2 Guardrail shall be designed so that it will not be removed in the intended direction of use.

3.5.3 The guardrail shall be designed so that it will not be removed in the intended direction of use.

3.5.4 The guardrail shall be designed so that it will not be removed in the intended direction of use.

3.5.5 A guardrail shall be provided on all four sides of the foundation unless the foundation is a single piece and the guardrail is a separate piece.

3.6 Bed End

3.6.1 The bed end shall be designed so that it will not be removed in the intended direction of use.

3.6.2 The bed end shall be designed so that it will not be removed in the intended direction of use.

3.6.3 The bed end shall be designed so that it will not be removed in the intended direction of use.

3.7 Ladder

3.7.1 A ladder shall be provided on all four sides of the foundation unless the foundation is a single piece and the ladder is a separate piece.

3.7.2 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.3 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.4 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.5 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.6 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.7 The ladder shall be designed so that it will not be removed in the intended direction of use.

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3.7.12 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.13 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.14 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.15 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.16 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.17 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.18 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.19 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.20 The ladder shall be designed so that it will not be removed in the intended direction of use.

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3.7.44 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.7.45 The ladder shall be designed so that it will not be removed in the intended direction of use.

3.5 Guardrail

3.5.1 A guardrail must accompany any bed in which the underside of the foundation is over 35 inches from the floor. A manufacturer shall offer a second guardrail as an optional accessory. Guardrails may be separate from or integral with the ladder.

3.5.2 Guardrails shall be attached in a manner that requires the intentional release of a fastening device or be so designed that they cannot be removed unless forces are applied sequentially in different directions.

3.5.3 The upper edge of the guardrail shall be at least 5 inches above the sleeping surface when a mattress of a thickness that is the maximum specified by the manufacturer's instructions is used on the bed.

3.5.4 There shall be no openings in the rigid bed structure below the lower edge of the guardrail that would permit the free passage of a 3½ inch cube in any orientation or the lower edge of the guardrail shall not be more than 1 inch from the mattress. These requirements shall be maintained when a lateral force of 33 lbf is applied to the center of the guardrail in an outward direction.

3.5.5 A guardrail may terminate before reaching the end structure of the bed providing that there is not more than 15 inches between either end of the guardrail and the end structures of the bed.

3.6 Bed End Structure

3.6.1 The upper edge of the upper bunk end structures for at least 50% of the distance between the two posts at the head and foot of the upper bunk shall be at least 5" above the sleeping surface when a mattress and foundation of the size and thickness specified by the manufacturer's Instructional Literature is used on the upper bunk.

3.6.2 There shall be no opening in the end structures of the upper bunk that would allow the free passage of a cube of any dimension between 3½ inches and 8 inches in any orientation when the recommended mattress and foundation are in place. End structure openings of the upper bunk which permit free passage of an 8 inch or larger cube, or a 3½ inch or smaller cube are acceptable.

3.6.3 These specifications pertaining to the end structures of the upper bunk shall apply only to that portion of the upper bunk above the support system of the upper bunk.

3.7 Ladders

3.7.1 A lean-on (slanted) or hang-on (vertical) ladder may be supplied with each set of bunk beds or the ladder may be incorporated as part of the headboard or footboard of the bed. The ladder may be separate from or integral with the guardrail. The ladder bracket shall be designed to prevent inadvertent disengagement or repositioning or tilting while in use.

3.7.2 The width of the ladder shall be no less than 12 inches measured from the outside of the stiles. Vertical spacing of ladder steps shall be

no greater than 12 inches. When head or footboards are used as ladders, vertical spacing may be up to 16 inches.

3.8 Marking and Labeling—The following permanent marking or labels shall be on the bed. A marking or label shall be considered permanent if, during an attempt to manually remove it without the aid of tools or solvents, it cannot be removed, it tears, or it damages the surface to which it is attached.

3.8.1 There shall be a permanent marking on the bed, which may be in code, identifying the manufacturer, location of plant in which bed was produced (if manufacturer has more than one plant), and month and year of manufacture.

3.8.2 Labeling—a caution label shall be permanently attached to a bedend structure of the top bunk, in a location which cannot be covered by the bedding but which may be covered by the placement of the pillow.

CAUTION

Guardrail/mattress position and size are important.
Follow written instructions with this bed.
If not against wall use two guardrails.
Prohibit children under 6 years on top bunk.
Always use guardrail and ladder.
Ensure all connectors are tight.
Prohibit horseplay on or under bed.

DO NOT REMOVE THIS LABEL

3.9 Instruction—Written instructions shall accompany each bunk bed. These instructions shall include, as a minimum, the following:

1. **PARTS LIST**—List each item included and those tools needed to assemble the bed.
2. **INSTRUCTIONS FOR ASSEMBLY**—Detailed diagrams which show exactly how the bed should be assembled, including specific instructions pertaining to:
 - (a) Bed and structures;
 - (b) Installation of foundation or support system for the mattress and/or springs;
 - (c) Fit of the upper bunk to the bottom bunk;
 - (d) Attachment of guardrails; and
 - (e) Attachment of ladders.

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Doug Brackett, /
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3. **SIZE MATTRESS AND FOUNDATION**—Detail description of the acceptable size of mattress and/or foundation as to length, width and thickness. Specify the location of the guardrail in relation to the side rails and the top of the mattress.
4. **OTHER PARTS**—A statement that:
A second guardrail and replacement parts can be obtained from any of our (Insert Manufacturers Name) dealers.
5. **SAFETY PRECAUTIONS**—The instructions shall include the following safety precautions:
 - (a) Follow the information on the label attached to the bunk bed on the top bed end structure. Do not remove this label.
 - (b) Use the recommended size mattress and/or foundation to reduce the likelihood of entrapment and falls.
 - (c) Do not allow children under six to use the upper bunk.
 - (d) Periodically insure that the guardrail, ladder, and other components, are maintained in proper position and repair and that all connectors are tight.
 - (e) Do not allow horseplay or jumping on or under the bed.
 - (f) Do not use substitute parts. Ask the dealer for replacement parts.
 - (g) Use a nightlight as an added safety precaution for persons using the upper bunk.
 - (h) Use two guardrails on the upper bunk if the side of the bunk bed is located other than against a wall.

KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE.

Addendum

The American Furniture Manufacturers Association gratefully acknowledges the assistance and support of the following individuals in the formulation of the Voluntary Bunk Bed Safety Guidelines.

Russ Abolt, National Assoc. of Bedding Mfgs., Arlington, VA
Larry Beasley, Acorn Products, Hartselle, AL
Doug Brackett, American Furniture Mfgs. Assoc., High Point, NC
Ron Cepulo, Pilliod Cabinet Co., Swanton, OH
Billy Chitwood, Bassett Furn. Inds., Bassett, VA
Melvin Clark, Stanley Furniture Co., Stanleytown, VA
Roy Clarke, A. Brandt Co., Inc., Fort Worth, TX
Kevin Clary, Sears Roebuck & Co., Inc., Chicago, IL
Bob Craig, Cosco, Columbus, IN
Leonard De Fiore, Consumer Products Safety Commission, Washington, DC
Shelly Deppa, Consumer Products Safety Commission, Washington, DC

Eleanor Parsonhardt, Levitz, Boca Raton, FL
Pat Fairall, Consumer Products Safety Commission, Washington, DC
Joe Gerard, American Furniture Mfgs. Assoc., Washington, DC
Bruce Hardy, Broyhill Furn. Ind., Lenoir, NC
Danny Hodges, Bassett Furn. Inds., Bassett, VA
Mark James, Lea Industries, Morristown, TN
Bill Kemp, Jr., Kemp Furniture, Goldsboro, NC
Harry Klaasen, Leggett & Platt, Springfield, MS
Jack Krage, Karel of Cumberland, Chicago, IL
Robert Kupchick, Karel of Cumberland, Chicago, IL
Steve Lail, Dixie Furniture Co., Lexington, NC
Carl Litsinger, J.C. Penney Co., New York, NY
Jim McCallister, DMI, Louisville, KY
Bob Martin, Armstrong Furniture, Lancaster, PA
Gerald Nagy, National Assoc. of Bedding Mfgs., Arlington, VA
Liam O'Brien, Sears, Roebuck & Co., Chicago, IL
Kevin O'Connor, Lea Industries, High Point, NC
John Preston, Consumer Products Safety Commission, Washington, DC
Richard Ralston, Leggett & Platt, Springfield, MS
Ben Rawls, Lea Industries, High Point, NC
Ernest Richards, Bunker Hill, Pontotoc, MS
Norwood Robinson, Petree, Stockton, Winston-Salem, NC
Carl Strand, Dresher, Chicago, IL
Basil Turbyfill, Jackson of Danville, Danville, KY
Elaine Tyrrell, Consumer Products Safety Commission, Washington, DC
James Wall, This End Up, Raleigh, NC
Erroll Ward, J.C. Penney Co., NY, NY
Jack Watson, J.C. Penney Co., NY, NY
Ron Wolfe, Universal Furn., Morristown, TN
Joseph Ziolkowski, American Furniture Mfgs. Assoc., High Point, NC

Consumer Product SAFETY ALERT

FROM THE U.S. CONSUMER PRODUCT SAFETY COMMISSION, WASHINGTON, D.C. 20207

March 1985

Under laws administered by CPSC, an estimated 325 million potentially hazardous products have been called back from the marketplace and consumers since 1973 (when CPSC was created). Most of these were voluntarily recalled by manufacturers who established programs to repair or replace the products, or to refund the purchase price.

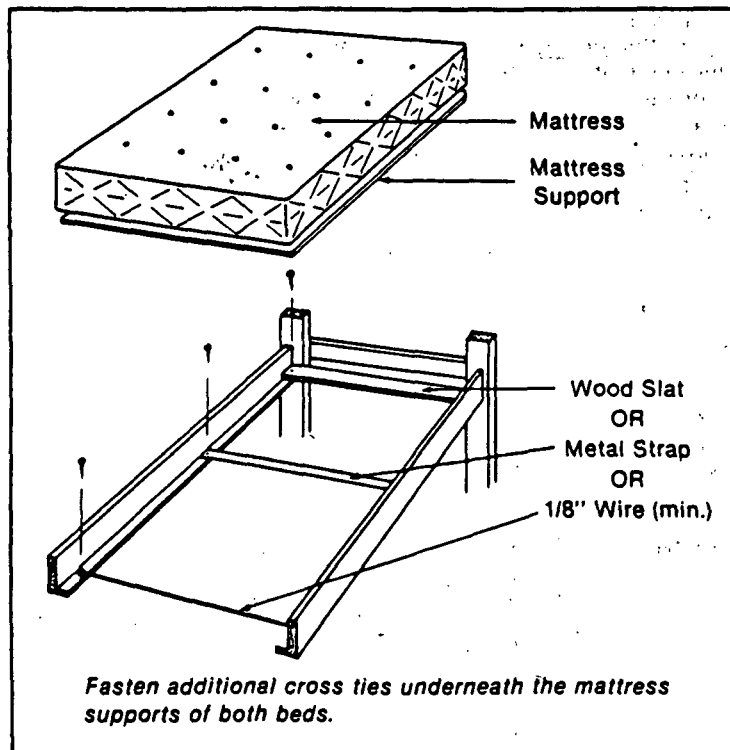
CPSC Warns Consumers of Bunk Bed Hazards

The Consumer Product Safety Commission has received reports of injuries and deaths associated with bunk beds and warns consumers about three hazards that have been noted:

1. MATTRESS SUPPORT... A

two-year old child, who apparently was playing on the floor beneath one unit of a bunk bed, was killed when the mattress support and mattress fell through the bed frame and landed on him. This

narrow ledges attached to the side rails, and can be dislodged easily by a child kicking or pushing up on them. The Commission has received complaints of bunk bed mattresses and their supports falling through the frame when children were playing on or under the beds or when someone was making the bed. The Commission knows of at least three deaths involving this hazard since 1973.



is a potential hazard with many bunk beds in which the mattress supports are not secured to the bunk bed frames. The supports rest on

The Commission recommends: *Fasten additional cross ties underneath the mattress supports of both beds, or permanently screw*

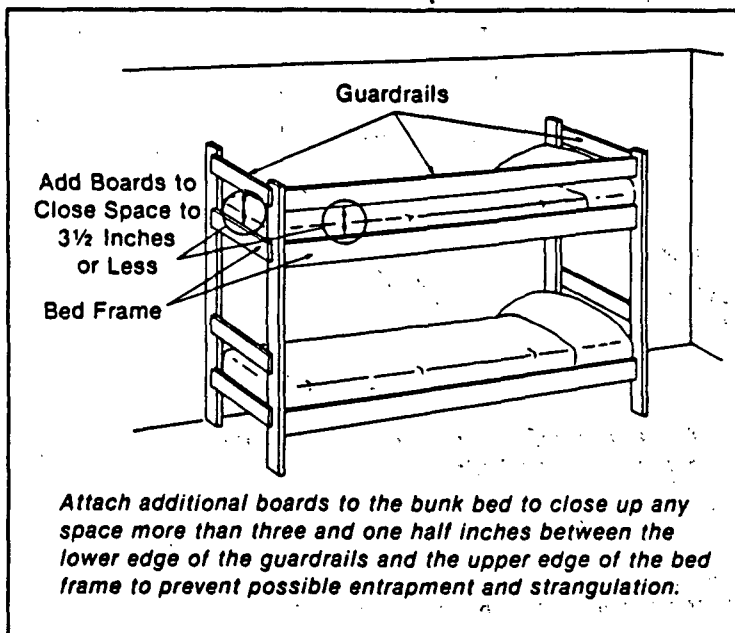
CPSC Warns Consumers of Bunk Bed Hazards (continued)

the mattress supports to the bunk bed frames. This will reduce the risk of the mattress and support falling through and landing on a child who may be under either bed.

2. SPACE BETWEEN THE GUARDRAILS AND THE MATTRESS ... Some bunk beds have a space between the lower edge of the guardrails and the top surface of the mattress. A young child can slip through these small openings feet first, when his/her weight presses the mattress down. The child's head can then be caught between the guardrail and the depressed mattress causing strangulation. This can occur when the opening between the guardrail and a depressed mattress is greater than three and one half inches. The Commission knows of at least four deaths involving this hazard since 1973.

pressions will vary, the space should be measured between the lower edge of the guardrail and the upper edge of the bed frame and should be three and one half inches or less. (See illustration.) This will reduce the risk of a child's body slipping into this opening.

3. ENTRAPMENT BETWEEN BED AND WALL ... The Commission has learned of ten deaths of very young children, six to 15 months, who became entrapped between the bed and the wall. Because bunk beds do not usually have a rail on the wall side, a very young child can roll into the space between the bed and the wall, and his/her head or chest may be caught in the space.
The Commission recommends: Children under two years of age should use a crib rather than a bed.



The Commission recommends: Attach additional boards to the bunk bed to close any space which is more than three and one half inches. Because mattress de-

If you want to report an accident with bunk beds, please call the CPSC toll-free Hotline, 800-638-CPSC. A toll-free teletypewriter number is 800-638-8270 (Maryland 800-492-8104).

NEWS from CPSC

U.S. Consumer Product Safety Commission

FOR RELEASE: APRIL 8, 1985

CPSC WARNS OF BUNK BEDS DANGERS

WASHINGTON, D.C. -- Following many reports of injuries and deaths from bunk bed accidents, the Consumer Product Safety Commission today issued three warnings and recommendations to alert consumers of the dangers associated with the product.

Three of the most common problems are:

1. MATTRESS SUPPORT: There is a potential hazard with respect to those bunk beds in which the mattress supports are not well secured to the bed frames. The supports often rest on narrow ledges attached to the side rails and can easily be dislodged by a child kicking or pushing them. The Commission knows of at least three deaths involving this danger.

RECOMMENDATION: Fasten additional cross-ties underneath the mattress supports of both beds, or permanently screw the mattress supports to the bunk bed frames. This will reduce the risk of the mattress and support falling through and landing on a child who may be under either bed.

2. SPACE BETWEEN GUARDRAILS AND MATTRESS: Some bunk beds have a space between the lower edge of the guardrails and the top surface of the mattress. A young child can slip through these small openings (if more than 3 1/4 inches) feet first when the baby's weight presses the mattress down. The child's head can then be caught between the guardrail

and the depressed mattress causing strangulation. The Commission knows of at least four deaths involving this hazard.

RECOMMENDATION: Attach additional boards to the bunk bed closing any space over 3½ inches. Mattress depressions vary and the space should be measured between the lower edge of the guardrail and the upper edge of the bed frame.

3. ENTRAPMENT BETWEEN BED AND WALL: Because bunk beds usually lack a rail on the wall side, very young children can roll into the space between the bed and wall and have their head or chest caught in the space. The Commission knows of ten deaths of youngsters 6 to 15 months trapped in this manner.

RECOMMENDATION: Children under two should be placed in a crib rather than a bed.

To report any bunk bed accidents call the CPSC's toll-free Hotline on 800-638-CPSC. A teletypewriter number for the hearing-impaired is 800-638-8270.

† † †

Memorandum

TO : Elaine A. Tyrrell, EX-P
Through: James I. Price, Director, ESMT *JIP*
Through: James E. Bradley, Director, ESHF
FROM : John D. Preston, ESMT *JDP*
Shelley Waters Deppa, ESHF *SWD*
SUBJECT: Comments on Revised Voluntary Bunk Bed Safety Guidelines

DATE: 16 DEC 1985

In response to a request made in a meeting with the Executive Director on December 9, 1985, we are providing comments on the Voluntary Bunk Bed Safety Guidelines transmitted to you by AFMA on December 5, 1985 and received on December 9, 1985.

1. SCOPE
 - 1.2. It is stated that the "guideline is intended to minimize accidents to children resulting from normal use". We find this scope too narrow. Typically, other mandatory and voluntary standards addressing children's products contain statements that they are intended to minimize hazards resulting from both normal use and reasonably foreseeable misuse and abuse. 2
 - 1.3. The current language does not make it clear as to whether the requirements apply only to beds which are both "a set..(of) sleeping units..., and (are)...over 40 inches from the floor". We believe that any bed which is over a specified distance from the floor should be included in the scope of the guidelines. For example, there are beds which are mounted over dressers or bookshelves (but not over another bed) which should be included in the scope. We note that the draft ISO standard for bunk beds (ISO 136/1 N221) applies to any bed "which may be assembled for use at a height of 900 mm or more above floor level, irrespective of the use to which the space below is put." We suggest that the Safety Guidelines should contain similar language.

We also question the rationale for the 40 inch dimension and seek a clarification on the location on the bed to which this height above the floor applies. In paragraph 1.3 it states that the requirements apply to "...any bed that has a foundation support system over 40 inches from the floor." In

paragraph 3.5 (Guardrails) it states that a guardrail must accompany "...any bed that has a sleeping surface height of 40 inches or more from floor level". These are conflicting requirements that should be changed to be consistent.

In addition, the ISO standard applies to beds over 35½ inches (900 mm) from the floor. We suggest that, for uniformity, the subject Safety Guidelines should adopt a similar dimension unless there is some good reason for the 40 inch figure.

- 1.5. Is it appropriate to reference "the U.S. Consumer Product Safety Commission" in this paragraph?

2. DEFINITIONS

- 2.1. Bed End Structures - This definition should be expanded to state that these structures are also intended to prevent an occupant from sliding out of the bed. We are aware of a least one incident of entrapment of a child who slid through an opening in an end structure. Again we draw attention to the ISO standard which requires four "safety barriers" on the upper bunk. In other words, the end structure must serve as a safety barrier to minimize falls from the upper bunk.
- 2.3. Foundation - The examples of foundations in the guidelines (box springs, foam foundations, and open bed springs) do not appear to be the best examples of typical bunk bed mattress foundations. Those that we have observed were most often fabricated from wood in lattice structure, as individual cross slats, or as a sheet of plywood. We also suggest the addition of a definition for the support system to distinguish between what is a foundation and what is a support system.
- 2.4. Guardrail - The statement that guardrails are "to help prevent a sleeping occupant from rolling out of the bed" should be changed. We suggest that this paragraph should state: "Guardrail - a rail to help prevent an occupant from rolling or sliding out of the bed." We believe that many guardrail entrapment incidents were result of a child sliding out of the bed rather than rolling out.

3. GENERAL REQUIREMENTS

- 3.1. The citations for the technical requirements for sharp points and sharp edges should be Section 1500.48 and .49 not Part 1500.48 and .49.

- 3.4.1. Support System - This paragraph is vague and could permit the continued use of potentially hazardous support systems. For example, bunk beds which employ ledges running the full length of the side rails as a support system have been involved in incidents in which the mattress and foundation became dislodged and fell. Since these ledges are generally screwed and/or glued to the side rails, they would withstand a considerable upwards force without damage.

We think that the support system should require cross slats (similar to the ANSI Standard, ANSI Z357.1, but with a minimum of two) on both the upper and lower beds. These cross slats shall not be capable of being dislodged without the use of hand tools or shall require intentional release of positive fastening devices.

We believe that the requirements addressing the integrity of the mattress support system are an important provision in the guidelines. For example, in addition to the potential hazard of an upper unit falling onto a lower unit, bunk beds may present a hazard when erected as individual twin-beds. Beds that have this capability generally have more space between the underside of the foundation and the floor than conventional twin-beds. This may be due to the thinner foundations found on most bunk beds or may be the result of the beds being designed so that they are identical to each other. Bunk beds are frequently used by children who may find that the space beneath the foundation is an attractive place in which to play.

- 3.4.3. Hook-On Side Rails - We note that the suggested methods of attachment are merely "desirable". We believe that these should be requirements.

We are not sure what is meant by an attachment mechanism that has "a self tightening feature." If such an attachment can be detached by an upwards force we suggest it should not be permitted.

- 3.5 Guardrail - As previously stated, the 40 inch "sleeping surface" height requirement is inconsistent with paragraph 1.3.

We believe that the statement that "A manufacturer may elect to offer a second guardrail as an optional accessory" is too weak. As a minimum, manufacturers should be required to offer a second guardrail as an option but we would prefer that a second guardrail be mandatory. We note that the ISO bunk bed standard requires four safety barriers (2 side guardrails and the head and footboard structure). Ten deaths resulted when children between the ages of 6 and 15 months became

entrapped between a bunk bed mattress and a wall. While these children are younger than the normally intended occupants of bunk beds, it is foreseeable that the presence of barriers on three sides may give a parent a false sense of security. We believe that a parent may not recognize the hazard of entrapment between the mattress and wall and may use a bunk bed in the twin bed configuration pushed against a wall as a place for a young child to sleep.

If a second guardrail is to be optional, its availability should be noted in the instructional literature together with a statement concerning the hazard of entrapment between bed and wall.

H We have previously suggested that there should be a requirement addressing the attachment of guardrails to the bed structure (October 11, 1985 letter from Elaine Tyrrell to Joseph Ziolkowski). Guardrails should be attached in a manner that requires the use of hand tools or a deliberate operation of a mechanical release mechanism for their removal. The ISO standard states that guardrails shall not be removable "without the aid of a tool". We do not believe that a "hook-on" guardrail that relies on gravity for its security is adequate to address entrapment between the guardrail and bed structure (side rail). For example, a child may slide between a mattress and guardrail and cause the guardrail to lift. This would negate the 3 1/2 inch spacing provision.

H We note that the guidelines permit a guardrail that has a space between its underside and the mattress surface of not more than 1 inch. We voiced our objection to such a requirement at the August 22, 1985 meeting with industry representatives because bunk beds generally are not sold with mattresses and manufacturers cannot, therefore, control mattress compressibility. In response, we were told that beds that would rely on this provision for compliance with the guardrail requirements would have an explanation of the importance of this 1 inch spacing in the instructional literature. No such requirement is present in paragraph 3.8 - Instructional Literature.

L 3.5.1(a) What is the rationale for the requirement for the end structure to be 5 inches above the sleeping surface for only 50% of the distance between the posts?

H 3.5.1(b) We object to the provision that permits openings that "...permit free passage of an 8 inch or larger cube." This could allow children to become entrapped or fall from the ends

of a bunk bed. The bed end structures should be designed to prevent children from sliding out of the bed.

- L
- 3.6. Ladders - The statement that ladders should be "designed to prevent inadvertent disengagement, tilting or sliding" is vague. We believe that it would be difficult to determine conformance with such a subjective requirement. The addition of a specified force that would be applied to a ladder to determine its security is desirable. The ISO bunk bed standard specifies such a force together with the location and direction of the force.

We do not believe that "when head or footboards are used as ladders, vertical spacing (of the rungs) may be up to 16 inches" is an adequate requirement. The only rationale for this spacing was voiced at the August 22, 1985 meeting when industry representatives stated that the 12 inch spacing requirement "would eliminate one of the most popular beds on the market." The optimum rung spacing for adult ladders is between 11 and 12 inches (Human Engineering Guide to Equipment Design by Van Cott and Kinkade).

- H
- 3.7. Labeling - We note that there is no requirement for a label that would identify the name and address of the manufacturer, distributor or seller of the product. Nor is there a requirement for a manufacturing date or date code. We feel very strongly that these should be present on the product. The ANSI bunk bed standard requires identification of the manufacturer, distributor or private-brand seller and manufacturing date to be on the bed.

- H
- 3.8. Instructional Literature - We are concerned that the instructional literature may be discarded or lost after the assembly of a bed. A consumer would then be without any information concerning the mattress thickness requirements. If a replacement mattress is purchased or if the bed is sold to a second user, this safety information would not be present. In the previous (1979) safety guidelines and in the ANSI voluntary standard, mattress information was required on a label affixed to the bed. We suggest that information be on a label to inform consumers of the importance of the 5 inch guardrail height provision. In addition, on beds relying on the 1 inch spacing between mattress and underside of the guardrail, this information should also be present on a label. This label can be either an extension of the one specified in 3.7 or a separate label.

cc: D. Noble, OEX

Memorandum

TO : Pat Fairall, EX-P
Through: James I. Price, Director, ESMT
Through: James E. Bradley, Director, ESHF
FROM : John Preston, ESMT
Shelley Waters Deppa, ESHF SWD

DATE: January 10, 1986

SUBJECT: Rationale for CPSC Staff Suggested Requirements for Bunk Bed
Guardrails and End Structures

In our memo of December 16, 1985, to Elaine Tyrrell concerning comments on the revised bunk bed safety guidelines, we stated the following:

"We object to the provision that permits openings that '...permit free passage of an 8-inch or larger cube.' This could allow children to become entrapped or fall from the ends of a bunk bed. The bed end structures should be designed to prevent children from sliding out of the bed."

At a December 19, 1985, meeting with representatives of AFMA, it was questioned why CPSC staff did not object to the provision that permits 15-inch horizontal openings at the ends of bunk bed guardrails, but did object to 8-inch or larger openings in end structures. The following is an explanation of these seemingly different staff opinions concerning the size of openings that can or cannot be permitted.

The difference between the hazard pattern of a child sliding through an opening in an end structure and through an opening between the end of a guardrail and end structure is determined by the child's orientation in the bunk bed. A sleeping child in a bunk bed will generally be oriented parallel to the major axis of the bed (body parallel to guardrail(s) with head and feet adjacent to each end structure). See Figures 1(a) and 1(b).

In order to prevent a child from sliding out of an opening in the end structure, the opening must be smaller than a child's torso thickness. (Figure 1(a)). Since the thickness of a child ranges between 3 1/2 and 8 inches, an opening between these dimensions could entrap a child, which may result in strangulation. An opening larger than 8 inches would permit a child to slide out of the bed and fall to the floor. Therefore, the 8-inch test cube would not eliminate this hazard and is unacceptable. Only an opening which is less than 3 1/2 inches would prevent a child from sliding through the end structure.

On the other hand, in order to prevent a child from sliding out of an opening between the end of the guardrail and the end structure, the opening must be smaller than the child's length. (Figure 1(b)). Since the smallest user's length is 32 inches, even a child in a curled-up position would not slide into a 15-inch opening.

In the December 19, 1985, meeting, it was stated by representatives of AFMA that the inter-industry bunk bed task group members wanted 8-inch and greater openings in end structures to permit greater design flexibility. We believe that there are many designs for bunk bed end structures that can be both attractive and at the same time have no openings that would permit passage of a 3 1/2-inch cube. Figure 2 illustrates two such designs that would conform to the CPSC staff suggested requirement for 3.5.1(b) which is:

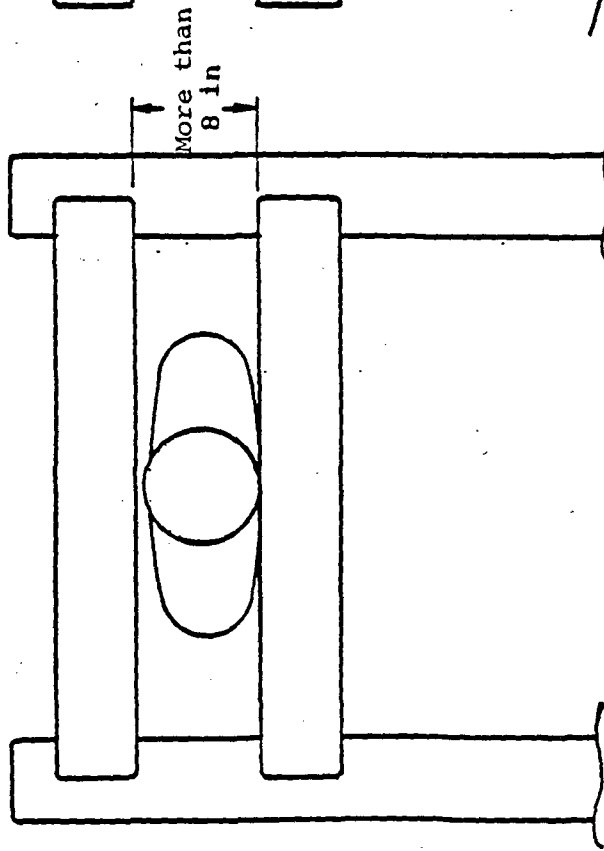
"There shall be no opening in the end structures of the upper bunk that would allow the free passage of a 3 1/2-inch cube in any orientation. This guideline pertaining to the end structures of the upper bunk shall apply only to that portion of the end structure that is above the support system of the upper bunk."

Attachments

bcc Walton
Bradley
Price
Elder
Noble
Preston
ESHF:SDEPPA:phg:1/9/86

NOT TO SCALE

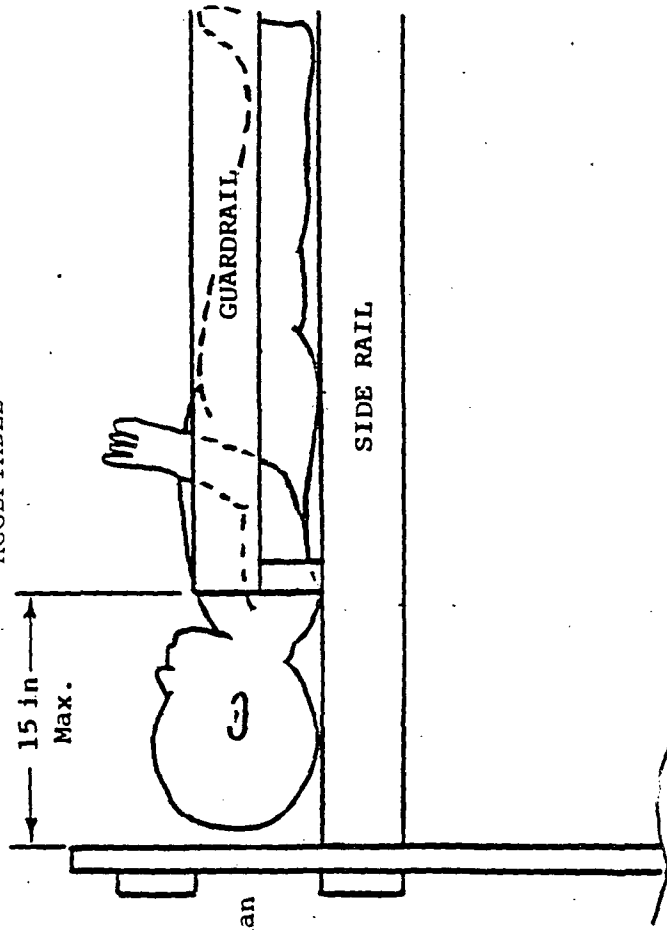
UNACCEPTABLE



END VIEW OF UPPER BUNK

This opening is unacceptable as it is larger than the child's torso, permitting the child to slide through the opening.

ACCEPTABLE



SIDE VIEW OF UPPER BUNK

This opening is acceptable as it is smaller than the child's length, preventing the child from sliding through the opening.

FIGURE 1(b)

FIGURE 1(a)

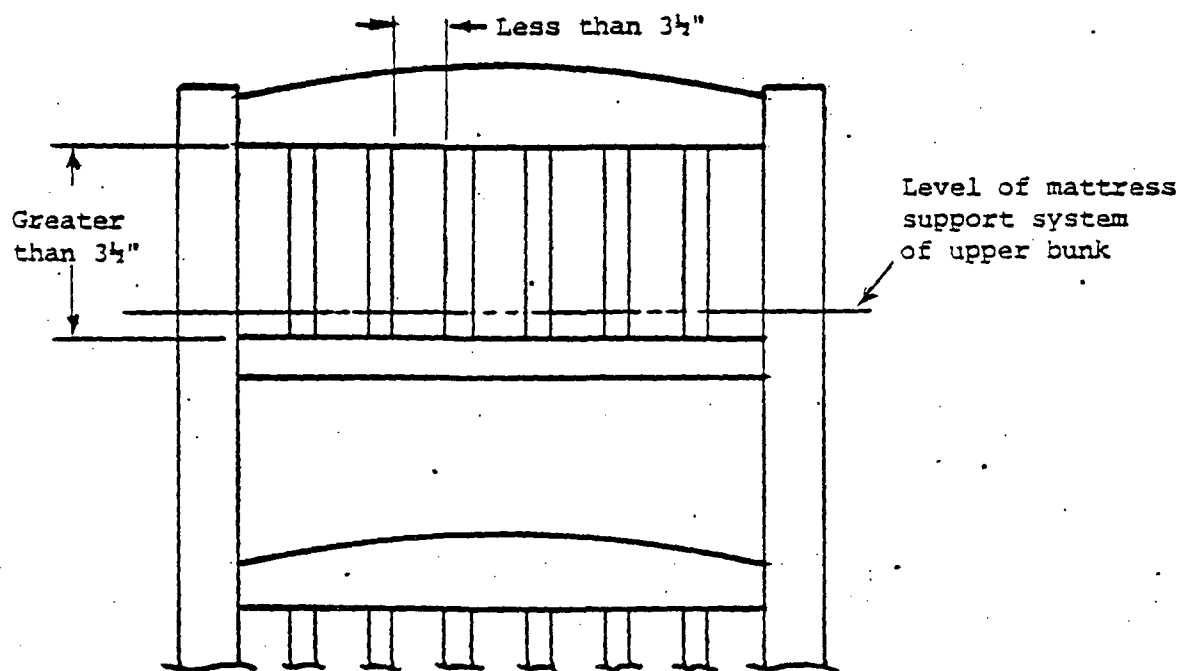
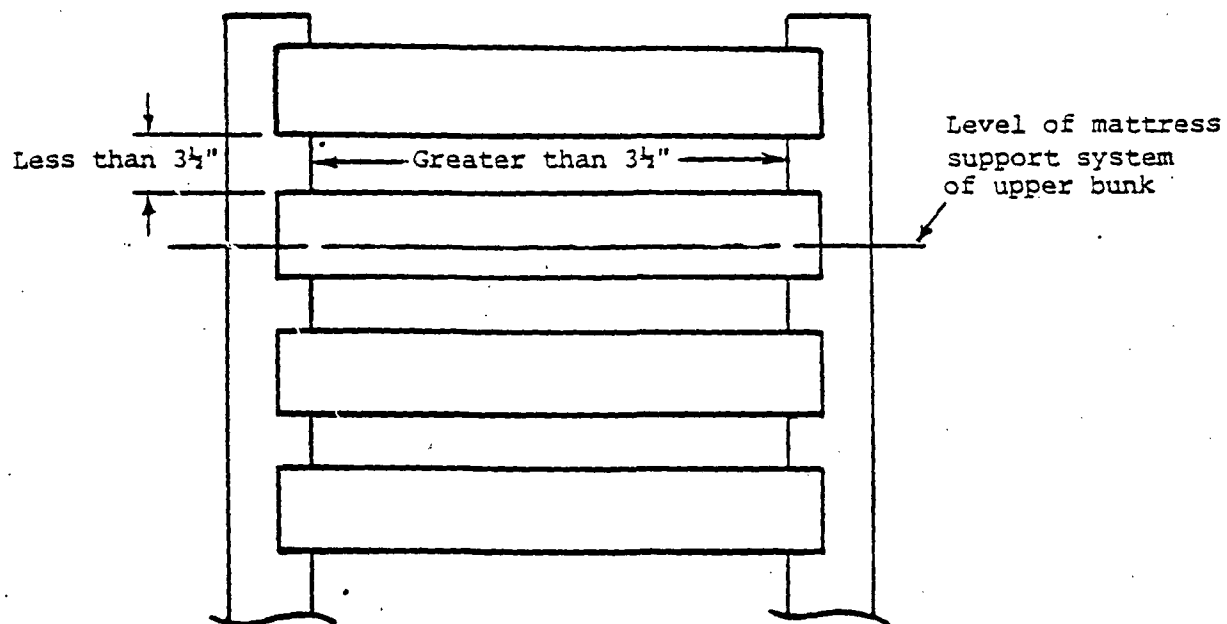


FIGURE 2 - TWO DESIGNS FOR BED END STRUCTURES THAT WOULD CONFORM TO CPSC STAFF SUGGESTED REQUIREMENT FOR 3.5.1(b)



U.S. CONSUMER PRODUCT SAFETY COMMISSION

WASHINGTON, D.C. 20207

February 11, 1986

Mr. Joseph Ziolkowski
Director of Technical Services
American Furniture Manufacturers Association
P.O. Box HP-7
High Point, NC 27261

Dear Joe:

This letter is a follow-up to the January 30, 1986 Inter-Industry Bunk Bed Meeting in Greensboro, NC. The CPSC staff that attended the meeting believe that the exchange of views was fruitful and that we are close to achieving mutual agreement on final safety guidelines for bunk beds.

Enclosed with this letter is a redrafted version of the safety guidelines that contain the changes that were discussed by CPSC staff and industry representatives at the Greensboro meeting. In addition, staff has suggested some other changes which are outlined in the attached memo. Some of these changes are minor to correct editorial inconsistencies. However, other changes are significant and are pointed out in the staff memo.

Should you wish to discuss any of these changes with us, please do not hesitate to call. John Preston can be reached at 301-492-6494 and Shelley Waters Deppa can be reached at 301-492-6468.

Sincerely,

A handwritten signature in cursive script, appearing to read "Pat", is written over the typed name.

Patricia A. Fairall
Acting Project Manager
Children's and Recreational
Products Program

Enclosure

cc: Joseph Gerard

UNITED STATES GOVERNMENT

Memorandum

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : Pat Fairall, EX-P
THROUGH: James I. Price, Director, ESMT
FROM : THROUGH: James E. Bradley, Director, ESHF
John D. Preston, ESMT
Shelley Waters Deppa, ESHF
SUBJECT: Voluntary Bunk Bed Safety Guidelines

DATE: FEB 11 1986

Attached to this memo, is a copy of the Voluntary Bunk Bed Safety Guidelines which incorporate the changes that were discussed at the meeting with industry representatives held at Greensboro, NC on January 30, 1986. Some of these changes were to incorporate new language that was agreed to at the meeting. However, we have made additional changes to suggest new wording for provisions identified as being needed at the meeting, to make provisions more understandable, and to correct inconsistencies in the previous version of the guidelines.

The following is an outline of the significant changes that have been made to the guidelines. Numbers correspond to those used in the attached version of the guidelines, some of which differ from the version drafted by AFMA.

- 1.3 Industry suggested new language to define which bunk beds are to be included in the scope of the guidelines. This would have included any bed in which the underside of the foundation support system is over 35 inches from the floor. Since the underside of the foundation support system is not a clearly identified location on some bunk beds, we suggest a change to include in the scope "...any bed in which the underside of the foundation is more than 35 inches from the floor." This language change has been incorporated into the attached guidelines in both Section 1.3 and 3.5.1. Note that the language in this section was repeated in (old) Section 2.2. We have, therefore, deleted (old) Section 2.2 and renumbered the provisions in Section 2 accordingly.
- 1.5 Language change per discussion at meeting of January 30.
- 2.1 Bed End Structures - Language change per discussion at meeting of January 30 and superfluous words "...to be attached..." have been deleted.
- 2.2 Foundation - Language change per industry suggestion at meeting of January 30 with slight editorial changes.
- 2.3 Guardrail - Language change per discussion at meeting of January 30.

CPSA 6 (b)(1) Cleared

2/11/86
No Mfrs/Prvblrs or
Products Identified

Excepted by
Firms Notified,

- 2.5 Side Rail - Editorial change to delete the term "Support base" which was not defined in the guidelines. The term "foundation support system" has been substituted.
- 3.3 Interior Dimensions of Bed Structure - Entire section changed and retitled. In the previous guidelines this section was titled "Mattress and Foundation Size and Fit" and drew attention to the requirement for including mattress size information in the instructional literature. Since this is already stated in (new) Section 3.9, we believe it is not needed elsewhere. Note that the suggested interior size requirement for the bed structure states that it should not be more than 1½ inches greater than the nominal size of the mattress. We believe this dimension is about as close as can be specified if both mattress and structure tolerances are acknowledged.
- 3.4 Per meeting of January 30, abbreviated to title only .
 - 3.4.1 Language changed per discussion at meeting of January 30.
 - 3.4.3 Language changed per meeting of January 30.
- 3.5 Guardrail - Attached redraft of guidelines show a numbering change to this section concerning guardrail requirements. Section 3.5 contains only the title. Individual provisions for the guardrail become sub-paragraphs 3.5.1 through 3.5.5.
 - 3.5.1 Words "support system" deleted for reason stated in 1.3.
 - 3.5.2 Editorial changes made to the new language that was suggested by industry at meeting of January 30.
 - 3.5.3 New number for same provision in previous guidelines.
 - 3.5.4 Per discussion at meeting of January 30, words "above the top of the mattress" changed to "from the mattress".
 - 3.5.5 New number for same provision in previous guidelines.
- 3.6 Renumbered and abbreviated to title only. Individual requirements have been assigned sub-paragraph numbers.
 - 3.6.1 Requirement changed per meeting of January 30 and excludes from the 5 inch height requirement a zone within 6 inches of the corner posts that was requested by industry. CPSC staff has verified that an exemption for a zone within 6 inches of the corner posts will not create a potential falling hazard. However, we would caution manufacturers

that this exempt zone could result in a head entrapment hazard if an end structure such as the design shown in IDI Report No. 810603HIA1289 is adopted. This is one of the reports given to industry at the meeting of January 30. Such designs have resulted in head entrapment/strangulations in cribs but the older children for whom bunk beds are intended may be less likely to be at risk.

- 3.6.2 New language drafted by CPSC staff as directed by industry at meeting of January 30.
- 3.7 Ladders - Renumbered and abbreviated to title only. Individual requirements for ladders have been assigned sub-paragraph numbers with same requirements as in previous guidelines.
- 3.8 Labeling - Renumbered and abbreviated to title only. Includes definition of permanency per discussion at meeting of January 30.
 - 3.8.1 New requirement for identification of manufacturer and date of manufacture to be permanently marked on the bed.
 - 3.8.2 CPSC staff has reduced the amount of text in the statements on the warning label.
 - 3.8.3 New requirement suggested by CPSC staff for a separate label for mattress size information. Rather than specifying the required length and width of the mattress, we have suggested that it should be referred to by the name (i.e. twin or twin extra long, etc.) under which it is sold. This suggestion assumes that mattress manufacturers observe the size requirements for mattresses contained in the voluntary standard for bedding products and components, ANSI Z357.1. If industry believes that mattress manufacturers do not generally observe the requirements in this standard, they may wish to specify on the mattress information label the actual dimensions of the required mattress.
- 3.9 Some editorial changes have been made to the language of the instructions that were passed out at the meeting of January 30.

Attachment

VOLUNTARY BUNK BED SAFETY GUIDELINES

Introduction

The purpose of these voluntary product guidelines is to establish nationally recognized safety guidelines for Bunk Beds and to provide a basis for common understanding as to the safe use of bunk beds among producers, distributors, and users.

It is felt that voluntary use of guidelines by the industry and users will effectively address the preventable injuries associated with bunk beds.

1. Scope

- 1.1 These voluntary guidelines establish minimum construction and labeling requirements for bunk beds.
- 1.2 These voluntary guidelines are intended to minimize accidents to children resulting from normal use.
- 1.3 For purposes of these voluntary guidelines, a bunk bed is defined as a set of components which may be assembled as sleeping units, one stacked over the other, or any bed in which the underside of the foundation is over 35 inches from the floor.
- 1.4 No bunk bed may indicate compliance with the guidelines unless it conforms to all requirements contained herein.
- 1.5 These voluntary guidelines have been prepared by a Voluntary Inter-Industry Bunk Bed Standing Committee.

2. Definitions

For the purposes of this standard, the following definitions shall apply:

- 2.1 Bed End Structures - an upright unit at the head and foot of the bed, to which the side rails attach.
- 2.2 Foundation - The base or support for a mattress. The foundation may be independent from or incorporated with the sleeping surface by means of a fabric cover. The foundation is typically a rigid lattice, fabricated from wood, plastic, or other material, covered with rigid or semi-rigid material to provide uniform support for the mattress.
- 2.3 Guardrail - a rail to help prevent a sleeping occupant from rolling or sliding out of the bed.

2.4 Mattress - a manufactured product intended to be slept on, consisting of various resilient materials covered with an outer ticking.

2.5 Side Rail - the rail attached to a headboard and footboard to which the foundation support system is fastened.

3. General Requirements

3.1 All finishes and materials used in the construction of products covered under these voluntary guidelines must be nonhazardous as defined by the Federal Hazardous Substances Act Regulations as they may exist at the time the products are introduced into interstate commerce. Federal Regulation 16 CFR Section 1500.49 (sharp edge), 16 CFR Section 1500.48 (sharp points), 16 CFR Part 1501 (small parts), and 16 CFR Part 1303 (lead-containing paints) are in effect and are administered by the Consumer Product Safety Commission. These Federal Regulations itemized above are not part of these voluntary guidelines. This information is offered to all parties so that they know that these Federal Regulations must be adhered to outside of the scope of these voluntary guidelines.

3.2 Fit Of Top Bed To Bottom Bed - the bed post shall be designed so that either the minimum height of lift to allow horizontal disengagement of the top bed from the bottom bed shall be 1½ inches or a fastening mechanism may be used which will prevent the disengagement of the top bed from the bottom bed.

3.3 Interior Dimensions of Bed Structure - The interior length and width of the bunk bed structure shall be no more than 1½ inch greater than the nominal length and width of the mattress (as stated in the voluntary standard for Bedding Products and Components, ANSI Z357.1) that is intended to be used on the bed.

3.4 Support System, Side Rails and Side Rail Attachments.

3.4.1 Support System - the support system shall confine the horizontal position of the mattress and the foundation and shall prohibit the mattress or foundation from falling into the clearance over the lower bunk or to the floor when the mattress or foundation is manipulated. The support system shall not be capable of being dislodged without the release of positive fastening devices or the use of hand tools. In the event cross members are utilized, a minimum of two per bed are required.

- 3.4.2 Bolt-On Side Rails - bolt-on side rails that attach at their ends or on their side to the bed post shall be secured at each end by two bolts with a minimum size of $\frac{1}{2}$ inch diameter, spaced a minimum of 2 inches apart on their centers. When the bolts are fully tightened in the assembled bed, no more than $\frac{1}{4}$ inch of thread shall be exposed.
- 3.4.3 Hook-On Side Rails - hook on side rails shall be securely attached to the bed post. Hook-on attachments shall require an additional action other than an upwards force to disengage.
- 3.4.4 Other post to bed side rail fastening systems will be considered to be in conformance to this guideline, provided such systems support a vertical 225 lbf (pounds force) load applied for 30 seconds to the side rail, 10 inches from the bed ends, to be done successively at each corner of the bed, without structural failure.

3.5 Guardrail

- 3.5.1 A guardrail must accompany any bed in which the underside of the foundation is over 35 inches from the floor. A manufacturer shall offer a second guardrail as an optional accessory. Guardrails may be separate from or integral with the ladder.
- 3.5.2 Guardrails shall be attached in a manner that requires the intentional release of a fastening device or be so designed that they cannot be removed unless forces are applied sequentially in different directions.
- 3.5.3 The upper edge of the guardrail shall be at least 5 inches above the sleeping surface when a mattress of a thickness that is the maximum specified by the manufacturer's instructions is used on the bed.
- 3.5.4 There shall be no openings in the rigid bed structure below the lower edge of the guardrail that would permit the free passage of a $3\frac{1}{2}$ inch cube in any orientation or the lower edge of the guardrail shall not be more than 1 inch from the mattress. These requirements shall be maintained when a lateral force of 33 lbf is applied to the center of the guardrail in an outward direction.

- 3.5.5 A guardrail may terminate before reaching the end structures of the bed providing that there is not more than 15 inches between either end of the guardrail and the end structures of the bed.

3.6 Bed End Structure

- 3.6.1 The upper edge of the upper bunk end structures shall be at least 5 inches above the sleeping surface when a mattress and foundation of the size and thickness specified by the manufacturer's instructions is used on the upper bunk. Portions of the End Structure that are within 6 inches of the bed posts are exempt from this requirement.

- 3.6.2 There shall be no openings in the upper bunk end structures above the foundation support system that would permit the free passage of a $3\frac{1}{2}$ inch cube in any orientation, or, if an opening not meeting this requirement extends above the level of the sleeping surface, its upper boundary shall be no more than 1 inch from the mattress.

3.7 Ladders

- 3.7.1 A lean-on (slanted) or hang-on (vertical) ladder may be supplied with each set of bunk beds or the ladder may be incorporated as part of the headboard or footboard of the bed. The ladder may be separate from or integral with the guardrail. If separate from the guardrail, the ladder bracket shall be designed to prevent inadvertent disengagement or repositioning while in use, tilting while the ladder is being climbed, and sliding along the side rail.

- 3.7.2 The width of the ladder shall be no less than 12 inches measured from the outside of the stiles. Vertical spacing of ladder steps shall be no greater than 12 inches. When head or footboards are used as ladders, vertical spacing may be up to 16 inches.

- 3.8 Marking and Labeling - The following permanent markings or labels shall be on the bed. A marking or label shall be considered permanent if, during an attempt to manually remove it without the aid of tools or solvents, it cannot be removed, it tears, or it damages the surface to which it is attached.

- 3.8.1 There shall be a permanent marking on the bed, which may be in code, identifying the manufacturer, location of plant in which bed was produced (if manufacturer has more than one plant), and month and year of manufacture.

- 3.8.2 Warning Label - A warning label shall be permanently attached on the headboard of the upper bunk in a location which cannot be covered by the bedding but which may be covered by the placement of the pillow.

 WARNING
IMPROPER USE CAN CAUSE FALLING HAZARD Prohibit children under 6 on top bunk. Prohibit horseplay on or under bed. Only use proper size mattresses. Always use guardrail and ladder. Do Not Remove

- 3.8.3 Information Label - An information label shall be permanently attached on the post of the upper bunk, on the guardrail, or on the ladder side rail. The manufacturer shall select the appropriate words in parenthesis that apply to his products.

MATTRESS SIZE
USE ONLY MATTRESSES WHICH ARE: (twin or twin extra long, etc.) with thicknesses (between ___ and ___" or of ___"). At least 5" below top of guardrail. *No more than 1" from bottom of guardrail. Do Not Remove

* Use only when bed does not comply with 3½ cube requirement specified in Section 3.5.4.

3.9 Instructions - Written instructions shall accompany each bunk bed. These instructions shall include, as a minimum, the following:

1. PARTS LIST - List each item included and those tools needed to assemble the bed.
2. INSTRUCTIONS FOR ASSEMBLY - Detailed diagrams which show exactly how the bed should be assembled, including specific instructions pertaining to:
 - (a) Bed end structures;
 - (b) Installation of foundation or support system for the mattress and/or springs;
 - (c) Fit of the upper bunk to the bottom bunk;
 - (d) Attachment of guardrails; and
 - (e) Attachment of ladders.
3. SIZE OF MATTRESS AND FOUNDATION - Detailed description of the acceptable size of mattress and/or foundation as to length, width and thickness. Specify the location of the guardrail in relation to the side rails and the top of the mattress.
4. OTHER PARTS - A statement that:
 - (a) A second guardrail is available from _____.
 - (b) Replacement parts can be obtained from _____.
5. SAFETY PRECAUTIONS - The instructions shall include the following safety precautions:
 - (a) Follow the information on the two labels attached to the bunk bed. These are located on (i) the headboard, and (ii) the post of the upper bunk, the guardrail or the ladder side rail. Do not remove these labels;
 - (b) Use the recommended size mattress and/or foundation to reduce the likelihood of entrapment and falls;

- (c) Do not allow children under six to use the upper bunk;
- (d) Periodically insure that the guardrail, ladder, and other components, are maintained in proper position and repair and that all connectors are tight;
- (e) Do not allow horseplay or jumping on the bed;
- (f) Do not use substitute parts. Ask the dealer for replacement parts;
- (g) Use a nightlight as an added safety precaution for persons using the upper bunk; and
- (h) Use two guardrails on the upper bunk if the side of the bunk bed is located other than against a wall.

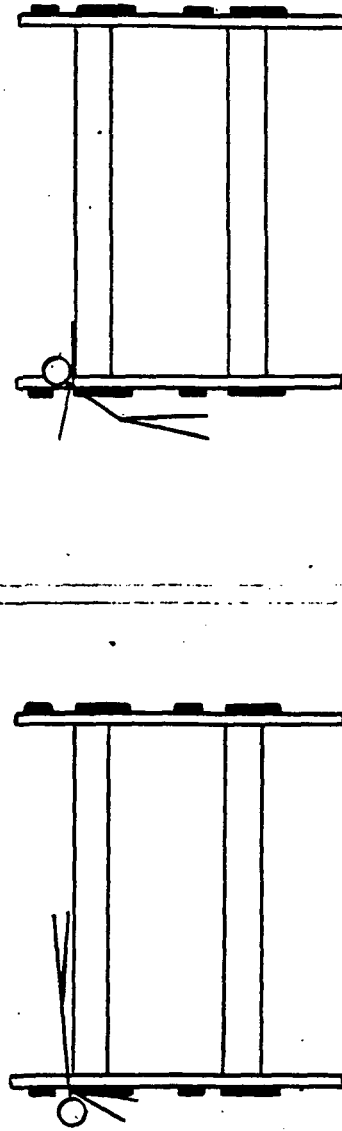
KEEP THESE INSTRUCTIONS FOR FUTURE REFERENCE

ATTACHMENT 1

ENTRAPMENT IN OPENING BOUNDED ON BOTH SIDES BY ENDSTRUCTURE

HEAD FIRST			FEET FIRST		
CASE #	CHILD'S AGE (YEARS)	OPENING	CASE #	CHILD'S AGE (YEARS)	OPENING
C230030	2	6 1/4" horizontal	C430090	2	vertical
C230030	4	6 1/4" horizontal	H360008B1	3	vertical
C230099	3	vertical			

CASES



ILLUSTRATIONS

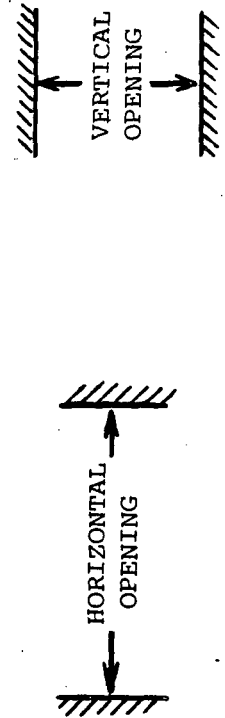
RECOMMENDATION

FOR

GUIDELINES

Revise Section 35.1(b). Endstructure to read: "There shall be no opening in the endstructures of the upper bunk that would allow free passage of a 3 1/2" cube in any orientation."

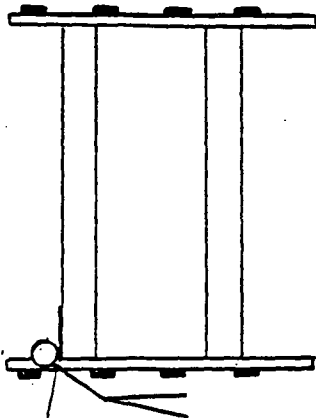
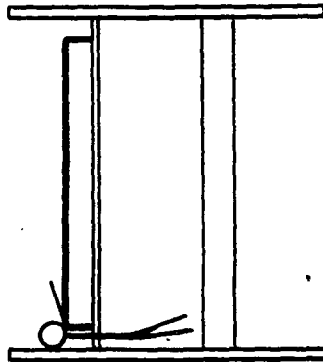
EXAMPLES OF HORIZONTAL AND VERTICAL OPENINGS



Handout for Bunk Bed meeting of 1/30/86

ATTACHMENT 2

FEET FIRST ENTRAPMENT BETWEEN ENDSTRUCTURE AND MATTRESS

<u>A</u>		<u>B</u>		<u>C</u>	
SUSPENDED AT ANGLE		SUSPENDED STRAIGHT DOWN		UNABLE TO TELL	
CASE #	CHILD'S OPENING AGE	CASE #	CHILD'S OPENING AGE	CASE # CHILD'S OPENING AGE	
840120WES0054	4 yr 5" diagonal	C430090	2 yr 4" horizontal	850823WES0166	20 mos 2" horizontal
841105CHI0168	2 yr 4" diagonal	810603HIA1289	4 yr 5½" horizontal	H4A0075AI	2 yr —
		*821230HIA5102	15 mos		
		*death			
				Unable to tell	
Revise Section 3.5.1(b) Endstructure to Read: "There shall be no opening in the endstructures of the upper bunk that would allow free passage of a 3 1/2" cube in any orientation."		Revise Section 3.3 Mattress and Foundation Size and Fit to specify that the relationship between mattress/foundation size and bed structure size is a tight fit.		Adoption of recommendations in columns 1 and 2 would address cases like these.	

CASES

ILLUSTRATIONS

COMMENTATION
FOR
GUIDELINES

Revise Section 3.5.1(b)
Endstructure to Read:
"There shall be no opening
in the endstructures of the
upper bunk that would allow
free passage of a 3 1/2"
cube in any orientation."

Revise Section 3.3 Mattress
and Foundation Size and Fit
to specify that the relationship
between mattress/foundation size
and bed structure size is a
tight fit.

Adoption of recommendations in
columns 1 and 2 would address
cases like these.

STAFF COMMENTS ON MAY 23, 1986, BUNK BED GUIDELINES

- Pages 1 and 2 - The term "guidelines" appears in both the singular and plural form. One form of the word should be chosen and used consistently throughout the document.
- Page 1, Sec. 2 - The term "standard" is used instead of "guideline(s)". They are not interchangeable terms. The word "Guideline(s)" should be used for this document.
- Page 1, ¶ 2.5 - The term "bed end structure" should be substituted for the words "headboard" and "footboard" to keep the language consistent with ¶ 2.1
- Page 2, ¶ 3.1 - This paragraph should reference the Standard for the Flammability of Mattresses and Mattress Pads, 16 C.F.R. Part 1632. During inspections of bunk bed manufacturers conducted by Commission staff this year, it was noted that a number of the manufacturers were manufacturing mattresses for their bunk beds. Approximately half a dozen firms were not in compliance with this mandatory standard.
- *Page 2, ¶ 3.3 - Mattress and Foundation Size and Fit. This paragraph should specify that the interior size of the bed structure should not be more than 1½ inches greater than the nominal size of the mattress. This dimension is believed to be the smallest that can be specified if both mattress and structure tolerances are acknowledged. The staff ranked this provision as HIGH. The staff is aware of at least four cases (including one death) where entrapment occurred between the mattress and bed structure.
- Page 2, ¶3.4.2 - Bolt - On Side Rails. The minimum spacing for side rail attachment bolts has been changed, and staff has not been informed of the reason for this change. In the 1979 Guidelines (later adopted as ANSI Standard Z357.1) the minimum bolt spacing was 4 inches. This was reduced to 2 inches in the December 1985 version of the Guidelines and is 1.5 inches in the current version. The staff believes that a 1.5 inch spacing could be inadequate for certain types of bolt-on side rails. The staff would like to have the Committee's rationale for this change in bolt spacing before giving a ranking to this provision.
- Page 3, ¶3.5.4 - Guardrail. The staff ranked this provision as HIGH. The staff is aware of at least 54 cases, including 10 deaths, of entrapment between the mattress and guardrail.

The staff believes that the first alternative, specifying a maximum opening between rigid bed structures and guardrail, is adequate to prevent entrapment ("there shall be no openings in the rigid bed structure below the lower edge of the guardrail that would permit the free passage of a 3½ inch cube in any orientation---"). It is questionable whether the second alternative, specifying a maximum opening between the mattress and guardrail, is appropriate ("--- or the lower edge of the guardrail shall not be more than 1 inch from the mattress"). Mattresses are often not supplied with the beds and can vary from 2 to 9 inches in thickness. In addition, mattress compressibility would result in inconsistent results.

Page 3, ¶3.6.1 - Bed End Structure. The staff prefers the wording for this paragraph that was submitted to AFMA in the February 11, 1986, memorandum: This was ranked by the staff as LOW. "The upper edge of the upper bunk bed structures shall be at least 5 inches above the sleeping surface when a mattress and foundation of the size and thickness specified by the manufacturer's instructions is used on the upper bunk. Portions of the end structure that are within 6 inches of the bed posts are exempt from this requirement."

* Page 3, ¶ 3.6.2 - The provisions in this paragraph would prevent openings that allow free passage of a cube of any dimension between 3½ inches and 8 inches in any orientation. This paragraph is worded such that at the end of the upper bunk bed an opening of 3½-inches or less between the end structure and the mattress would be acceptable. Mattress compressibility could result in an opening that is large enough to entrap a child. In addition, an opening in the end structure capable of permitting free passage of an 8-inch cube, could increase the likelihood that a child could fall from the top bunk, since a child could pass through an opening of this size. The staff recommends this language: "There shall be no openings in the rigid bed end structure of the upper bunk that would permit the free passage of a 3½-inch cube in any orientation."

Staff ranked this provision HIGH. A draft ISO standard contains requirements for bunk bed end structures that are similar to the staff's suggested provision in that they address both entrapment in and falls from the ends of a bed.

Pages 3 & 4,
¶ 3.7.1 &
¶ 3.7.2

Ladders. The term "bed end structure" should be substituted for the words "headboard" and "footboard" to keep the language consistent with that in ¶ 2.1.

*Page 4,
¶ 3.8.2

- Labeling. The staff ranked this as HIGH.

To the existing label, a) change signal word to "Warning", b) modify third sentence to read: "If upper bunk not against wall, use two guardrails.", and c) add sentence: "When bed, other than upper bunk is used as child's first regular bed, use second guardrail between bed and wall." In addition, add a second permanent label which specifies mattress size and fit.

This label attempts to address entrapment by stating, "Guardrail/mattress position and size are important." Since entrapment between mattress and guardrail can, but does not always, result in death, the proper signal word for the label is "Warning". "Caution" is used only when minor injury may result. "Danger" is used only if death will result. If there is a probability of death, "Warning" is the proper signal word.

The third sentence in the label gives the false sense of security that if the bed is against the wall, a second guardrail is not needed. At a minimum, this language should be made consistent with that in the Instructions by modifying it to read "If upper bunk is not against wall, use two guardrails."

Parents place children younger than six years either in the lower bunk or in a bunk bed used in the twin configuration, with a guardrail, when they have outgrown a crib. Staff is aware of at least 15 children who have died when they rolled between the bunk bed and the wall. Therefore, the staff believes that an additional sentence should be added recommending that when the bed is used as a child's first regular bed, a second guardrail be used between the bed and wall.

Regarding the addition of a second permanent label, the Guidelines rely on the proper mattress size to address entrapment. Therefore, it is important that the mattress size is specified on a permanent label.

Page 5,
¶ 3.9,5(e)

- Safety Precautions. This sentence needs to be rewritten. The current version implies that one can jump under the bed.

- * Page 5,
¶ 3.9,5(h) - Safety Precautions (Guardrails). The staff recommends the following additional language for this paragraph:
"Use two guardrails when the bed, in the twin configuration or as a lower bunk, is to be used as a child's first regular bed. Even when the bed is pushed against a wall, a young child may roll between the bed and wall resulting in entrapment and possible suffocation."

*Comments marked with an asterik by the paragraph number are considered by the staff as ranking HIGH.

SUMMARY OF PROVISIONS AND CPSC STAFF COMMENTS
TO 1986 FINAL BUNK BED SAFETY GUIDELINES

The accompanying table compares the provisions in the Bunk Bed Safety Guidelines submitted by AFMA in May 1986, to those of the Guidelines originally published in 1979 and incorporated into ANSI Z357.1 (Voluntary Standard for Bedding Products and Components), in 1981. Some provisions in the 1986 Guidelines are improvements over those in the 1979 and 1981 Guidelines. Notable among the improvements is the provision at 13.4.1, which addresses collapse of the mattress and foundation. Other examples are:

- Addition of reference to Federal Regulations (Note: With the exception of that for mattress flammability, which the staff is recommending be inserted).
- More positive attachment for hook-on side rails
- More positive attachment for guardrails.
- Addition of requirement for instructional literature (even though staff is making additional comments).
- Spacing under guardrail is better than it was but still needs work.

However, there are other provisions which the staff believes are weaker than those in the earlier Guidelines. The most critical of these is the labeling provisions. The labeling provisions in the 1979 and 1981 versions required that a label be affixed to the bed that addressed the importance of the relationship between the guardrail and mattress surface to minimize entrapment and fall incidents. The current Guidelines do not require any mattress size information in the labeling provisions. Other examples are:

- Bolt spacing for bolt-on side rails reduced - could be a problem on some beds.
- Ladder rung spacing (was 12" for all beds) now permits 16" spacing if ladder is part of bed structure.

SUMMARY OF PROVISIONS AND CPSC STAFF COMMENTS TO 1986 FINAL BUNK BED SAFETY GUIDELINES

PROVISION & HAZARD	1979 SAFETY GUIDELINES	VOL. STD., ANSI Z357.1	1986 FINAL SAFETY GUIDELINES	CPSC STAFF COMMENTS TO '86 GUIDELINES
Reference to CPSC Mandatory Regs. Several hazards.	No mention of requirement to comply with CPSC regulations.	Mentions mattress flammability only (16 CFR Part 1632)	References regs. for sharp edges & points, small parts & lead in paint	Staff suggests the addition of a reference to mattress flammability reg. 16 CFR Part 1632
<u>Mattress & Foundation Size & Fit. Entrapment.</u>	Specifies length of 74 $\frac{1}{4}$ in and width of 38 $\frac{1}{4}$ in.	Table 1 specifies the length & width of many mattresses but only one is called "bunk bed" mattress.	Specifies that the instructions shall contain mattress width, length & thickness of mattress and foundation.	*Staff believes that size of bunk bed structure (length/width) should be added. i.e. no more than 14 inches greater than nominal mattress size specified in ANSI Z357.1.
<u>Side Rails & Side Rail Attachments.</u> Falls due to collapse of bed.	Side rail flanges to be at least 75% of bed length. Cross tie device(s) required on top bunk only. Bolt spacing for bolt-on side rails that attach thru their ends 4 in min. & bolt dia. $\frac{1}{4}$ in minimum. For hook-on side rails, locking device or self-tightening feature is desirable.	Same as '79 guidelines with addition of bedfast pin location (1 inch from end of side rail). Same as 1979 guidelines. Same as 1979 guidelines	Support system shall not be dislodged without release of positive fastening devices or use of hand tools. Min. of 2 cross ties per bed required. Bolt spacing for bolt-on side rails 1.5 inch min. Bolt dia. $\frac{1}{4}$ inch min. Hook-on side rails shall have additional action other than upwards force to disengage. All types of side rail attachments shall support downwards force of 225 lbf.	Staff believes that 1.5 inch bolt spacing could be inadequate for some beds. Staff is unaware of rationale for this change.
<u>Guardrails.</u> Entrapment/Falls.	A guardrail must accompany each bed set & must cover an area from 3" to 5" above mattress surface. Max. space between multiple rails $\frac{3}{4}$ ". Guardrail attachments shall prevent inadvertent disengagement. Side guardrails may have 15" horizontal openings. End structure on top bunk shall reach no less than 5" above mattress surface.	Same as 1979 guidelines. Same as 1979 guidelines Same as 1979 guidelines Same as 1979 guidelines	Guardrail must accompany any bed in which underside of foundation is over 35" high. Guardrails shall attach with positive fastening devices or shall not be removed unless sequential forces in different directions are applied. Upper edge of guardrail shall be at least 5" above surface of specified mattress. No openings in rigid structure below guardrail that permit passage of $\frac{3}{4}$ " cube or lower edge of guardrail shall be not more than 1" from mattress. Side guardrails may have 15" horizontal openings.	*Staff is concerned that, because of mattress compressibility & other reasons, a space between underside of guardrail and mattress may not be effective in addressing the entrapment hazard.

SUMMARY OF PROVISIONS AND CPSC STAFF COMMENTS TO 1986 FINAL BUNK BED SAFETY GUIDELINES (CONTINUED)

PROVISION & HAZARD	1979 SAFETY GUIDELINES	VOL. STD.-ANSI Z357.1	1986 FINAL SAFETY GUIDELINES	CPSC STAFF COMMENTS TO '86 GUIDELINES
Bed End Structure Entrapment/Falls.	Provision that end structure shall reach no less than 5" above top bunk sleeping surface is part of guardrail requirements. No provision to address entrapment in openings.	Same as 1979 guidelines.	Upper edge of top bunk end structure shall, for at least 50% of distance between bed posts, be at least 5" above sleeping surface of specified mattress.	CPSC staff suggested language for this provision was not accepted. However, the requirement in the final version of the guidelines may be adequate to minimize falls from ends of upper bunk.
Ladders. Falls.	If ladder is detachable, its attachment should prevent inadvertent disengagement, tilting or sliding. Ladder width no less than 12" to outside of stiles. Vertical spacing of ladder steps no greater than 12".	Same as 1979 guidelines. Same as 1979 guidelines. Same as 1979 guidelines.	Openings in end structure shall prevent passage of 3 1/4" cube or permit passage of 8" cube. Applies to upper bunk only. Ladder attachment shall prevent inadvertent disengagement or repositioning or tilting while in use. Same as 1979 guidelines.	*Provision does not satisfactorily address either entrapment or falls from upper bunk. Openings in rigid bed structure should be no more than 3 1/4". Provision permits such openings between mattress and underside of guardrail and also permits openings over 8" which could result in falls
Marking/Labeling. Various hazards.	Two labels required. Cautionary label states: Top bunk is designed for use by child over 6 years of age. Use only with guardrail and ladder in their proper position. Second label cautions user to use mattress of a thickness that ensures safe guardrail height. Also requires identification of manufacturer, distributor or seller & time of manufacture. Safety pamphlet also should be supplied which repeats cautions.	All labeling requirements same as 1979 guidelines. States that pamphlet repeating the cautionary statements shall be supplied.	No requirement for label with mattress thickness/size information. Cautionary label states: Guardrail/mattress position and size are important. Follow written instructions with this bed. If not against wall, use 2 guardrails. Prohibit children under 6 years on top bunk. Always use guardrail and ladder. Insure all connectors are tight. Prohibit horseplay on or under bed.	*Staff had submitted language and format for 2 labels. One was warning label and other provided mattress size/thickness information. Industry rejected both staff suggested label. Staff believes labeling requirement in final version of guidelines is not satisfactory.

SUMMARY OF PROVISIONS AND CPSC STAFF COMMENTS TO 1986 FINAL BUNK BED SAFETY GUIDELINES (CONTINUED)

PROVISION & HAZARD	1979 SAFETY GUIDELINES	VOL. STD..ANSI Z357.1	1986 FINAL SAFETY GUIDELINES	CPSC STAFF COMMENTS TO '86 GUIDELINES
INSTRUCTIONAL LITERATURE. Various hazards.	No requirements for instructions in these guidelines.	No requirement for instructions in this standard.	Instructions shall include: Detailed diagrams showing how to assemble bunk bed. Size of mattress and foundation. Including length, width & thickness of mattress and relationship of mattress surface to guardrail. Statement that 2nd guardrail & replacements parts may be obtained from Mfr. Safety precautions as follows: Observe information on cautionary label on bed and do not remove this label. Use recommended mattress and foundation. Do not allow children under 6 years on top bunk. Periodically check condition of guardrail, ladder and other components. Do not allow horseplay. Do not use substitute parts. Ask dealer for replacements. Use nightlight as added safety precaution for person using top bunk. Use two guardrails on top bunk if bed is not against a wall. Keep instructions for future reference.	*Staff suggests use of 2 guardrails even when bed is against wall if it is to be used as young child's first regular bed.

NOTE: Staff suggestions marked with asterisk (*) have been ranked as HIGH priority and staff strongly urges Inter-Industry Bunk Bed Committee to incorporate these suggestions.

TECH NEWS

Why New Activities Begin in ASTM

Consideration of why a new standards activity is initiated in ASTM calls forth a multifaceted image of how such events have occurred in the past. The Society is uniquely positioned as a management system devoted to working towards the goal of its volunteers, that is, consensus standards. Any subject can thus be administered by the staff, provided that the interest to develop a document exists and organizes for that end.

A May 21, 1985, letter detailing the cooperation of the American Concrete Pipe Assn. (ACPA) with ASTM, which began a few years after ACPA's formation in 1907, illustrates how one ASTM member views his organization's involvement in the Society's work. The letter was written in re-

sponse to another trade association's query as to the "pros and cons of having standards activities managed through ASTM as opposed to directly by your own organization." Mike Bealey, vice-president of technical services for ACPA, responded, in part, as follows:

"Agencies and engineers accept national consensus standards much more readily than industry standards . . . the vast majority reference a standard as is, apparently because of the belief that the use of national consensus standards eliminates or reduces their liability . . .

ASTM recognizes that all members have a specific interest and bias, and that national consensus standards are developed by compromise and due process. In ASTM, the development process is rigidly regulated and reviewed continuously to insure that all

concerns are properly considered. One negative vote stops the process until the negative is resolved. The results are reasonable standards acceptable to almost anyone. . .

ASTM committees must be balanced at all times, which means that producer membership cannot exceed the combined consumer and general interest membership. This balance requirement effectively negates anti-trust and personal injury liability concerns regarding the content of standards. We have heard of personal injury suits against the engineer, agency, and ASTM over the use of a particular standard, but never against individual committee members. . .

Although we did not have industry standards, we have observed other industries that switched from industry/company standards to ASTM standards. In these cases, the biggest problem was the lack of an industry consensus and common objectives."

ASTM's Part

What ASTM headquarters provides to its members as regular services includes support for:

- Duplication and mailing of minutes, ballots, meeting notices, and other pertinent information,
- A staff manager assigned to each committee,
- Meeting arrangements,
- Editing and publication of standards and related materials,
- Word processing and computer support, and
- Publicity and promotion.

Furthermore, the organization as it has developed over its 90 years of existence, gives other advantages to those who work under its auspices:

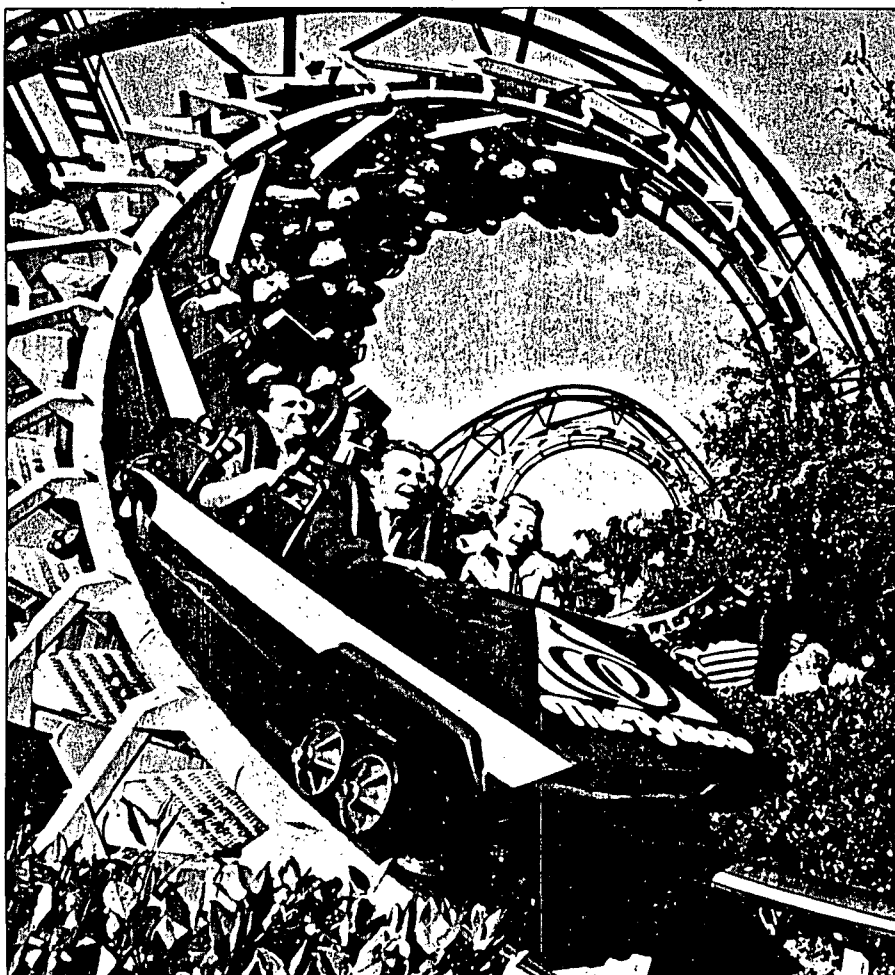
• Liability rests with the Society, not the individual member;

• As a consensus organization, input from all interests leads to a more credible and technically sound document;

• A wider use of the standard results since input from all those interested is needed, and if they participate, the document is more likely to be acceptable to them;

• The review of standards at any time when necessary to meet changing needs;

• Strong national and international



Amusement ride standards activities began in ASTM with the formation of F-24. The impetus for the committee's organization came from industry associations who saw a need for voluntary consensus documents.

TECH NEWS

recognition and use of ASTM standards;

- Activities at the forefront of technology; and
- Accessibility to other people in the field.

People who have not participated in the ASTM system may be apprehensive, comments staffer Kenneth Pearson, about how ASTM actually functions. What new members discover is that ASTM is an organization offering a neutral base in which they participate and make the decisions as to what standards are needed and develop the technical documents. The openness that encourages participation by all interested parties, and the due process system required by the *Regulations Governing ASTM Technical Committees*, ensures consideration of all interests in each individual standards effort.

Success Stories

A few examples of the many outside groups that have found an appropriate home for their standards activities in ASTM serve best to demonstrate the success of decisions to become part of the ASTM world. One such group is the Consumer Product Safety Commission (CPSC), which has found Committee F-15 on Consumer Products to be responsive to its requests. F-15 has initiated many standards efforts through impetus from CPSC, starting with a draft matchbook standard that was eventually incorporated into the regulation mandated by CPSC. The Juvenile Products Manufacturers Assn. (JPMA) has also influenced the work of the committee by working within it to develop standards for various items of children's furniture, such as high chairs and carriages.

A request from a number of outside organizations aided the beginning of Committee F-24 on Amusement Rides and Devices. The American Recreational Equipment Assn., the International Association of Amusement Parks and Attractions, and the American Society of Amusement Park Security and Safety Personnel collectively requested the formation of a standards writing group. The February 1978 issue of *Standardization News* reported

on the situation leading to the request: "At least ten states now enforce individual regulations governing amusement rides and devices that vary from state to state. This lack of uniformity in regulations has created economic problems for manufacturers, who are forced to produce specialized pieces in order to conform to the variety of state requirements. As a result, the cost of these rides to the customer has increased." F-24 has produced several standards that have aided the situation. The documents cover, among other things, amusement ride inspection, maintenance, operations, and testing.

The Consumer Federation of America (CFA) requested that Committee D-22 on Sampling and Analysis of Atmosphere develop standards to address the problems of measuring indoor air quality, providing an example of how a consumer group may be involved in ASTM. The organization prepared a paper for D-22 on the need to have monitoring protocols and other standards related to the instrumentation necessary to satisfy particular needs of the indoor environment. A new D-22 subcommittee resulted, which has task groups actively working on various aspects of indoor air quality, including organic and inorganic gases and vapors, particulate matter, radionuclides, biological aspects, and related factors.

Government support has been a positive influence on the standards activities of a number of committees. In the case of Committee F-25 on Shipbuilding, the Maritime Administration (MarAd), the U.S. Navy, and the U.S. Coast Guard support the committee's work. MarAd was involved in the beginning of F-25 through its sponsorship of the 1976 Castine Conference, which led first to the 1977 formation of Panel SP-6 in the Society of Naval Architects and Marine Engineers, which is not chartered to publish standards, and then to the 1978 formation of F-25.

Committee D-18 on Soil and Rock has received grants from the Nuclear Regulatory Commission to accelerate the development of draft standards that will be used in establishing quality assurance programs for high level

waste management. A number of drafts, now published as ASTM standards, have resulted.

The National Highway Traffic Safety Administration is supporting the work of Committee F-30 on Emergency Medical Services by grants enabling additional meetings to accelerate draft standards development. A number of drafts on equipment and its uses are being addressed due to the financial aid, including equipment and its uses; personnel training and education; organization and management; communications; and facilities.

The Member's Part

The very existence of these and other standards activities points to their value. People become involved in ASTM and then remain so because it works. Standards developed by ASTM members find use in all phases of manufacturing from specifying to testing raw materials and products. Standards provide consensus for other areas too: guidance in purchasing, practices for performing services, and terminology for common understanding. In any area, improving productivity, use of products and raw or scrap materials, and saving time, are acknowledged results of standardization. Standards can, and do, help in the marketplace, in what is offered, for both those who offer and those who want what is offered.

What more need be said regarding the value of standards? The next step rests with the member. If you know of a situation where a standard could help, make the next move. Simply express that need to Kenneth Pearson, ASTM (215/299-5520). Further information about pursuing a new standards activity can then be gathered, a group with the appropriate expertise convened, and work begun. Why not begin now?

ERRATUM

In the call for papers for the Symposium on Mechanical Relaxation of Residual Stresses, in the April issue, the date authors will be notified regarding acceptance is July 1 instead of June 1.



U.S. CONSUMER PRODUCT SAFETY COMMISSION

WASHINGTON, D.C. 20207

20 FEB 1985

Ms. Pat Lortz
National Association of Bedding
Manufacturers
Suite 601
1235 Jefferson Davis Highway
Arlington, Virginia 22202

Dear Pat:

In my letter to you of January 22, 1985, I indicated that I would forward staff recommendations for new provisions or revisions to ANSI 357.1 regarding bunk beds. Enclosed is a memorandum dated February 4, 1985, which includes discussion on the existing provisions for side rails and guardrails in the voluntary standard; reasons why we believe these provisions, as stated, are inadequate; and staff recommendations for improving these provisions. In addition, the memorandum includes a discussion on what appears to be a lack of industry conformance with all of the provisions of the voluntary standard. The staff recommends that language be added to the voluntary standard to stipulate that the product shall not bear any statements to indicate compliance with the standard unless it conforms to all requirements of the standard. Suggested wording is provided in the memorandum. As I have discussed with you earlier, I would also strongly recommend that the ANSI Committee establish a certification program for bunk beds complying with the voluntary standard. The last paragraph of the memorandum addresses this issue.

Draft language for revisions and additions to the current requirements of the standard will be forwarded shortly.

Also, I have enclosed purged copies of 182 letters relating to bunk beds that the Commission received from David Horowitz at NBC News in Burbank, California. Mr. Horowitz has aired segments on bunk beds several times following an incident involving the death of a two-year old in Colorado. The Commission is in the process of verifying

the accuracy of the information in these letters with the consumers and forwarding the letters to the manufacturers or retailers (private labelers). However, I am enclosing these letters, at this time, for use by your organization in the review of the voluntary standard provisions for bunk beds.

Sincerely,

Elaine A. Tyrrell

Elaine A. Tyrrell, Project Manager
Children's and Recreational Products
Program
Office of Program Management

Enclosures

cc: Mr. Russ Abolt
Secretariat for ANSI Z357.1
National Association of Bedding
Manufacturers
Suite 601
1235 Jefferson Davis Highway
Arlington, VA 22202

Mr. Joe Ziolkowski
Director of Technical Services
American Furniture Manufacturers
Association
P.O. Box HP-7
High Point, NC 27261

Ms. Betty-Grace Terpstra
Director
Congressional and Regulatory Affairs
American Furniture Manufacturers Association
918 16th Street, N.W., #402
Washington, DC 20006

Mr. William I. MacMillan, III
Executive Director
Juvenile Products Manufacturers Association
66 E. Main Street
Moorestown, NJ 08057

Memorandum

TO : Elaine Tyrrell, EX-P
THRU: James I. Price, Director, ESMT *JP*

DATE: February 4, 1985

FROM : John Preston, ESMT *JP*

SUBJECT: Voluntary Standard for Bedding Products and Components, ANSI Z357.1-1981

In response to your oral request, this memo contains some recommendations for changes to the requirements for bunk beds contained in Section 5.6 of the above mentioned voluntary standard. These recommendations are based on my own opinions and observations which, in turn, are based on a product safety assessment of a specific bunk bed involved in the death of a 2-year old boy and my review of several In-Depth Investigation (IDI) reports concerning bunk bed incidents.

5.6.3 Side Rails and Their Attachment

The requirements in this section address collapse of the mattress and/or mattress support. Such a collapse was reported in IDI Report No. 840126DAL5043 and, more recently, a second incident in which the mattress and its support fell on a 3-year old boy, but caused no injury, was reported in IDI report No. 841210HCC1048. Both of these incidents involved a bunk bed from the same manufacturer which, according to its distributor, conformed to the requirements for bunk beds in the voluntary standard.

In my opinion, the requirements in the standard that address collapse of the mattress and/or support are inadequate for two reasons. First, the standard permits the mattress of the lower unit of a bunk bed pair to be supported only by flanges on each of the side rails that must extend no less than 75% of the total length of the side rail. In one of the incidents cited above, the mattress that collapsed was on the lower unit of the bunk bed set and in the other case the beds were being used as twin beds. The bunk bed sets in both incidents had been supplied with "cross-tie devices" for only the upper unit, as is required by the standard. If cross-ties had been supplied for the lower units also, it is possible that these incidents could have been prevented. Therefore, my first suggestion would be for the requirement for cross-ties to be extended to both units of a bunk bed set and consideration should be given to extending the scope of the requirement for side rails and their attachment (5.6.3) to youth beds as well as bunk beds.

A second reason that I believe that the requirements for side rails and their attachment are inadequate concerns the effectiveness of a cross-tie device in preventing the collapse of a mattress and its

support. For example, the cross-ties supplied for use on the upper unit of the bunk bed sets in the cited IDI reports may not be effective in preventing mattress collapse incidents that are initiated by a child pushing or kicking upwards on the undersurface of the mattress support. The cross-ties supplied with these bunk beds (two for each upper bunk) were steel wires that traversed the space between the two side rails and had right angle bends at either end to enable them to be fitted into holes drilled vertically through the ledges in the side rails on which the mattress support rests. Tests have been conducted on the cross-ties of a bunk bed of this type at the CPSC Engineering Laboratory. It was found that the wire cross-ties were strong enough to support the mattress, and its support, together with a force of 56 lbf (equivalent to twice the weight of the 2-year old victim in IDI report No. 840126DAL5043) when one edge of the mattress support was deliberately disconnected from its supporting ledge on one side rail. However, it was noted that the wire cross-ties could easily become disconnected from their retaining holes in the side rails if a child exerted an upwards force on the cross-tie. Therefore, in addition to expanding the requirement for cross-ties to lower units of bunk beds and to youth beds, the ability of the cross-tie devices to perform their intended task should also be addressed. This could be achieved by developing a performance requirement for the mattress supporting system that might subject the system to both upward and downward forces. An alternative to a performance requirement could be a design requirement which could address the permanency of the attaching means for cross-ties.

5.6.4 Guardrails

Entrapment of children between the guardrail and mattress or side structure of bunk beds appears to be a continuing cause of injury and death. A recent IDI report (No. 841212HAA1050) describes such a death of a 28 month old girl on a bunk bed that, according to the report, may have conformed to the guardrail spacing requirements in Section 5.6.4 of the voluntary standard. There is conflicting information in this report concerning the space between the upper surface of the mattress and the undersurface of the guardrail. The narrative concerning the Product Description states that this space was 3½ inches and an attached figure shows it to be 3 inches. The standard requires that the lower edge of the guardrail shall be no more than 3 inches above the upper surface of the mattress. This requirement may be inadequate on two counts. First, if the bed has a very resilient mattress, a child's weight may depress the mattress sufficiently to cause an increase in the space under the guardrail that may permit passage of the legs and torso but not the head. As a result, strangulation could occur. Second, on some beds there is a horizontal displacement between the inner edge of the guardrail and the side or end of the mattress. As a result, a bed with a guardrail that complies with the requirement in the standard may still permit a child's torso to pass between the mattress and guardrail (see attached Figure 1).

Other Comments

As with all voluntary standards, the effectiveness of the ANSI standard in addressing bunk bed related incidents may be measured by the degree of conformance to its requirements by manufacturers. I have observed a number of different brands of bunk beds at retail furniture stores in the Washington, D.C. metropolitan area, and few appear to conform to all the requirements. As previously stated, the bunk bed involved in the death of the 2-year old boy reported in IDI report No. 840126DAL5043 was believed, by its distributor, to conform to the voluntary standard when in actual fact it had several features that did not conform. For example, the following non-conforming features were observed.

1. Side rails were not "bolt-on or hook-on" as required by Section 5.6.3. The side rails of the subject bed were secured by lag screws.
2. No separate ladder was supplied with the bunk bed set so it is presumed that access to upper bunk is intended to be by climbing up the horizontal members in the end panels. These members did not conform to the spacing requirements for the steps of ladders as stated in Section 5.6.5.
3. The standard states in Section 5.6.4 that "Head and foot ends of the top bunk shall also reach no less than 5 inches above the sleeping surface of the mattress." On the subject bed, the upper edge of the top horizontal rail on the end panel was about 1 inch above the sleeping surface of the mattress.

While none of the above non-conforming features of the bunk bed were the cause of the death of the 2-year old boy, we believe that in order to claim conformance with the voluntary standard, a product should conform to all requirements rather than just some of them. An addition to the standard might be in order which could state:

"No bunk bed produced after the approval date of this voluntary standard shall, either by label or other means, indicate compliance with the standard unless it conforms to all requirements contained herein."

A statement similar to the above is contained in a number of ASTM voluntary standards for juvenile products. It is also noteworthy that for some juvenile products there are certification procedures whereby manufacturers can have their products certified by an independent testing laboratory as being in conformance with the applicable voluntary standard. It is suggested that bunk bed manufacturers consider the establishment of a similar certification procedure for their products.

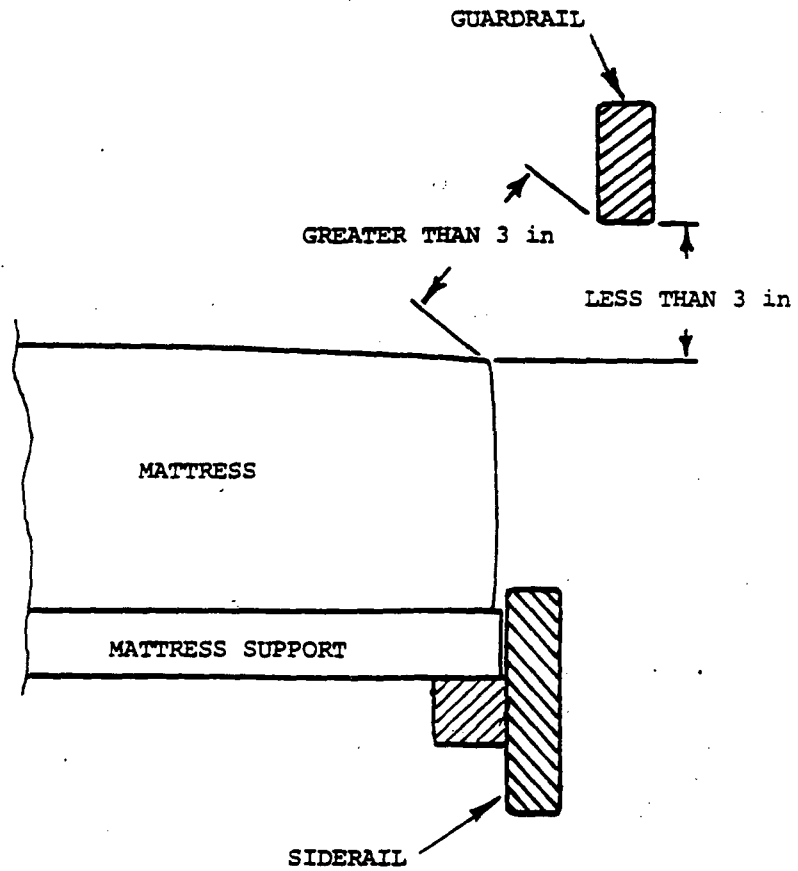


FIGURE 1 - Figure illustrates how a guardrail of a bunk bed may conform to the height requirements in the voluntary standard yet still permit a child's torso to pass between the mattress and lower edge of the guardrail

American ★ Furniture Manufacturers Association

July 15, 1987

OFFICE FOR GOVERNMENT AFFAIRS

918 16TH STREET, NW, SUITE 402
WASHINGTON, D.C. 20006
(202) 466-7362

Ms. Elaine A. Tyrrell
Project Manager
Children's & Recreational Products Program
Office of Program Management & Budget
U.S. Consumer Product Safety Commission
5401 Westbard Avenue
Bethesda, MD 20207

Dear Elaine:

Below I have set out the questions you raised with me on June 29. The answers, of course, follow each question..

1. a) How many firms make bunk beds?

Answer: According to the 1982 Census of Manufactures (the most recent data available from the U.S. Department of Commerce), there are 39 bunk bed manufacturers in the U.S.

- b) How many of those firms are AFMA members?

Answer: Of the 39 U.S. bunk bed manufacturers, we estimate that 32 of them are AFMA members.

2. a) What mechanism does AFMA have for notifying manufacturers of the Inter-Industry Bunk Bed Committee (IIBBC) Guidelines?

Answer: AFMA disseminates bunk bed press releases to the national press, furniture trade press and consumer shelter publications. AFMA also provides notices to its member companies.

- b) Does the mechanism include not only AFMA but non-AFMA members as well?

Answer: Yes.

- c) Does the mechanism include retailers, distributors and importers?

Answer: Yes.

3. What is AFMA's estimate of conformance with the IIBBC Guidelines?

Answer: AFMA estimates that in excess of 90% of the bunk beds now being produced for sale in the U.S. are in conformance with the IIBBC Guidelines.

4. Has anyone removed or sought to remove the ANSI guidelines?

Answer: No, but the ANSI guidelines will officially expire in February, 1988. Further, given the publicity associated with the May, 1986 Voluntary Bunk Bed Safety Guidelines, as well as the degree of conformance with those guidelines, it is clear that the bunk bed manufacturers are looking to the most recent product of the Inter-Industry Bunk Bed Committee and not the ANSI guidelines.

5. Is there any plan to have the IIBBC Guidelines adopted by any of the "voluntary standards' organizations"?

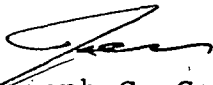
Answer: No, because the membership of the Inter-Industry Bunk Bed Committee (a national organization composed of furniture manufacturers, retailers and trade association representatives) believes that it can, in the future, as it has in the past, act more responsibly and expeditiously than the so-called voluntary standards' organizations. In addition, the IIBBC is a repository of bunk bed knowledge and experience that would be virtually impossible to duplicate in a generalist voluntary standards' organization.

6. Is there a mechanism for making further changes in updating or revising the IIBBC Guidelines?

Answer: Yes, because the Inter-Industry Bunk Bed Committee is a standing committee.

Elaine, I have attached a copy of the guidelines. Also, if you have other questions or comments, do not hesitate to contact me.

Sincerely,


Joseph G. Gerard
Vice President

JGG/hw
Attachment

cc: Mr. Leonard DeFiore

Memorandum

TO : Shelley Deppa, EPHF
George Lester, SPSI *George Lester*

DATE: 5/7/87

FROM : Allen Dobbins, PSI

SUBJECT: Bunk Bed Examination at Southern Furniture Market Show,
High Point, North Carolina

The following six furniture manufacturers' exhibits were visited and representative bunk beds were examined at the Southern Furniture Market Show on April 27 and 28, 1987, High Point, North Carolina. Mr. Joe Ziolkowski of the American Furniture Manufacturers Association made the arrangements and chose the exhibits to be visited.

Stanley Furniture Company
801 Industrial Boulevard
Bay Minette, Alabama 36507

Broyhill Furniture Industries
P.O. Box 700
Lenoir, North Carolina 28633

Karel of Cumberland
P.O. Box 38
Northbrook, Illinois 60062

Lea Industries
One Plaza Court
Box HP3
High Point, North Carolina 27261

Bassett Industries
P.O. Box 626
Bassett, Virginia 24055

Dixie Furniture Company
411 South Salisbury
Lexington, North Carolina 27292

On each bunk bed examined, the bottom and top bunk beds were held together by wooden or metal dow rods. The rods were long enough to produce the 1.25 inch lift required by the Voluntary Guidelines. All the beds had a support system not capable of being dislodged. Wire and wooden slats were seen along with metal rods which featured a Leggett and Platt fastening mechanism. All the beds had a minimum of two cross ties per bed.

CPSA 6 (b)(1) Cleared

MFR/PRVLBR NOTIFIED

☒ No Comments made EXCEPT

☒ Comments attached KAREL OF CUMBERLAND

☒ Excisions/Revisions 7/31/87

☒ Firm has not requested
further notice

10/1/87
☒ No Mfrs/PrvtLbrs or
Products Identified
☒ Excepted by *Alan [signature]*
☒ Firms Notified,
Comments Processed.

Guardrails were found on all beds. Some automatically provided the second guardrail. Instructions were not available for examination. However, all the firms that did not automatically offer the second guardrail indicated the instructions offered the customer the option of purchasing the second guardrail. Most of the guardrails had a fastening device or were screwed or bolted to the bed.

Examination of the ladders indicated all the firms ladders appeared to meet the requirements of the Voluntary Guidelines except for one firm, Bassett Industries. Bassett Industries had a ladder which did not require two forces in different directions to be removed. The attachment of the ladder was a hook that fit over the side rail of the bunk bed.

** All the guardrails' upper edges were at least five inches above the mattresses, although many of the beds did not have two mattresses and therefore this measurement may have not been completely accurate. All the guardrails met the 3-1/2 inch cube or one inch from mattress requirement for the space below the guardrail. Only one firm did not meet the 3-1/2 inch cubic requirement. Karel of Cumberland had a full length adjustable guardrail. As a thicker mattress is used on the bunk bed, the height of the guardrail can be raised. However, when the guardrail is raised, the space between the bottom of the guardrail and the siderail could increase beyond 3-1/2 inches. See the attached Sears bunk bed assembly instructions. This bed is made by Karel of Cumberland for Sears.

Many of the guardrails did terminate before the end structure. Stanley Furniture Company had two beds where the distance was 15-1/8 inch and 15-3/8 inches between the end of the guardrail and the endpost. Most of the beds had ladders which met the requirements for 12 inch width and 12 inch or less vertical spacing. Several beds were noted that had the ladder as part of the end structure and in these beds, the spacing between the ladder steps was less than 16 but in some cases as much as 14 inches.

I examined only two beds where the requirements for the 50 percent of end structure above five inches would apply. One met the requirements and the other did not have a mattress. Without the instructions providing the dimensions for the recommended mattress, I could not determine compliance.

** Karel of Cumberland by a letter dated July 31, 1987, has made comments regarding statements made about its products. That letter is attached for your information.

All the firms were using the attached labels supplied by the American Furniture Manufacturers Association. This label does appear permanent. None were concealed by bedding and most of the firms were using the labels on both beds including the bottom bunk bed. None of the firm's representatives could tell me where the manufacturer identification information was found. The only instructions that were available were those for the Sears bed which are attached.

ATTACHMENTS:

1. American Furniture Manufacturers Association label
2. Sears Bunk Bed Assembly Instructions

CAUTION

- Guardrail/mattress position and size are important.
- Follow written instructions with this bed.
- If not against wall use two guardrails.
- Prohibit children under 6 years on top bunk.
- Always use guardrail and ladder.
- Ensure all connectors are tight.
- Prohibit horseplay on or under bed.

DO NOT REMOVE THIS LABEL

Attachment 1
Southern Furniture Market
5-07-87 ACD
Bunk Beds



BUNK BED ASSEMBLY INSTRUCTIONS

RUSTIC PINE BUNK BED

PART* CONTENTS OF CARTON #67776 DK. PINE #67725 LT. PINE

- A. _____ One lower left-hand bunk bed end.
B. _____ One lower right-hand bunk bed end.
C. _____ One upper left-hand bunk bed end.
D. _____ One upper right-hand bunk bed end.

PART* CONTENTS OF CARTON #67777 DK. PINE #67726 LT. PINE

- E. _____ Four siderails 76" long x 5 1/4" high (each siderail has an attached support flange).
F. _____ One guardrail 76" long x 5 1/4" high.
G. _____ Four cross wires.
H. _____ Two posture boards.

PART* CONTENTS OF (2) HARDWARE BAG:

- I. _____ 20 each lag screw bolts, 20 flat washers.
J. _____ Four (4) each 3/8" x 2 1/2" steel dowel pins.
K. _____ Eight (8) #10 x 3/4" slotted head screws.
L. _____ Eight (8) #9 x 2 1/4" phillips flat head screws.

Tools Needed to Assemble

- | | |
|------------------------------|-----------------------------|
| 1 7/16" wrench or socket | 1 Phillips head screwdriver |
| 1 Straight blade screwdriver | 1 12" Ruler |

Note: Knots, checks and small cracks are natural characteristics and add part of the rustic beauty of the solid pine stock from which this furniture is constructed.

First, remove all materials from the carton and check contents against the contents list. If any items are missing, please contact:

Rustic Pine Bunk Bed
P.O. Box 38
Northbrook, IL 60065

(Do not proceed further with the assembly until all parts are in your possession).

FOLLOW THESE INSTRUCTIONS AND RETAIN FOR FUTURE REFERENCE

-1-

776/725-J1586

SOLD BY SEARS ROEBUCK & CO.
CHICAGO ILLINOIS 60684

Attachment 2
Southern Furniture Market
5-07-87 ACD
Bunk Beds

ENJOY YOUR NEW BUNK BED. IT'S SAFER THAN EVER, BUT IT'S NOT A TOY!

Two little children playing on a bed
One fell off and injured his head.
Went to the doctor and the doctor said,
"No more horseplay on the bed!"

It's a child's simple rhyme but it points out some of the safety warnings which you must remember:

SAFETY WARNINGS

1. Follow the information on the label attached to the bunk bed on the top end structure. Do not remove this label.
2. Use the recommended size mattress and/or foundation to reduce the likelihood of entrapment and falls.
3. Do not allow children under six to use the upper bunk.
4. A child under 35" of height should use a crib.
5. Periodically insure that the guardrail, ladder, and other components, are maintained in proper position and repair and that all connectors are tight.
6. Do not allow horseplay or jumping on or under the bed.
7. Do not use substitute parts. Ask the dealer for replacement parts.
8. Use a nightlight as an added safety precaution for persons using the upper bunk.
9. Use two guardrails on the upper bunk if the side of the bunk is located other than against the wall.

ASSEMBLY: YOU ARE NOW READY TO ASSEMBLE YOUR BUNK BED.....
NOTE: FOR EASE OF ASSEMBLY YOU WILL NEED A HELPER.

Remove all packaging from your work area and then decide where your bunk bed will be placed in the bedroom. This bunk bed is a free-standing bunk bed. The side without the wood guardrail should be placed against the wall.

But, if you choose to position the bunk bed out into your room, you must install an additional guardrail onto the top bunk for the child's protection. To purchase this additional guardrail and mounting hardware, contact your local Sears unit and order item #67504 Dark Pine or #67757 Light Pine.

For an overview of the assembly refer to the schematic diagrams on pages 6 and 7.

ASSEMBLY OF THE LOWER BUNK BED

1. Pick out the two lower bunk bed ends (Part A & B). These have square cut bottoms on the bed posts and a pre-drilled hole in the top of each footend post for the 3/8" x 2 1/2" long steel dowel pins.

2. Attach the siderails (Part E) to the lower bunk bed ends, (Part A & B) using the pre-drilled mounting holes and eight 1/4" x 4" lag bolts and flat washers, as provided, (Part I).

IF USING A TRUNDLE STORAGE BOX, ATTACH THE SIDERAILS USING THE UPPER SET OF HOLES (13 1/2" AND 16 1/2" FROM THE BOTTOM OF THE BED ENDS).

IF NOT USING A TRUNDLE STORAGE BOX, ATTACH THE SIDERAILS USING THE LOWER SET OF HOLES (8 1/2" AND 11 1/2" FROM THE BOTTOM OF THE BED ENDS).

Do not fully tighten the bolts, leave about 1/4" between the bolt head and bed end surface until both siderails are attached.

3. When both siderails are attached, securely tighten all bolts until there is no space between the end of the siderails and the bed ends and no space between the bolt head, washer, and bed end. Do not overtighten.

4. Next install cross wires on bed, whether being used as twin beds or bunk beds. Begin by installing two cross wires (Part G) on the lower beds. Seal the cross wire hook ends in the matching cutouts provided in the support flanges. These are approximately 17" from each end of the two siderails (Part E) as shown. Insert a #10 x 1/4" slotted head screw (Part K) into each hook end. Adjust the position of the cross wires to give minimum sag. The wires must be taut. Then tighten securely in place. Do not overtighten.

5. Carefully place the posture boards or bunkie on the siderail support flanges making sure both cross wires are in position and securely in place. Center the posture board evenly between the bed ends, also between the siderails. Insert the #9 x 2 1/4" Phillips flat head screws (Part L) from the under side through the pre-drilled holes in the side support flanges (Part E) approximately 5" from the end of the rail. While holding the posture board in place, screw into the posture board at all four corners.

6. Insert a 3/8" x 2 1/2" steel pin (Part J) into each of the holes provided in the top surface of each end on the lower bunk, as shown.

ASSEMBLY OF THE UPPER BUNK BED

7. Take out the two remaining bed ends (Part C & D). These are for the upper bunk. Each footend has a hole drilled on the bottom surface to fit over the steel dowel pin.

8. Attach two siderails (Part E) to the upper bunk bed ends (Part C & D) using the pre-drilled matching holes and the eight 1/4" x 4" long lag bolts and washers provided (Part I).

YOU MUST ATTACH THE SIDERAILS USING THE UPPER SET OF HOLES (13 1/2" AND 16 1/2" FROM THE BOTTOM OF THE BED END).

Do not fully tighten the lag screws. Leave about 1/2" between the bolt head washer and the bed end surfaces until both siderails are attached.

9. When both sides are attached, securely tighten all bolts until there is no space between the end of the siderails and the bed ends; and no space between the lag bolt head, washer and bed ends. Do not overtighten.

10. Install two cross wires (Part G) on the upper bed. Seat the cross wire hook ends in the matching cutouts provided in the support flanges. These holes are approximately 17" from each end of the two siderails (Part E), as shown. Insert a #10 x 3/4" slotted head screw (Part K) into each hook end. Adjust the position of the cross wires to give minimum sag. The wires should be taut. Then tighten securely in place. Do not overtighten.

11. Carefully place the posture board or bunkie on the siderail support flanges making sure both cross wires are in position and securely in place. Center the posture board evenly between the bed ends, also between the siderails. Insert the #9 x 2 1/4" Phillips flat head screws (Part L) from the under side through the pre-drilled holes in the side support flanges (Part E) approximately 5" from the end of the rail. While holding the posture board in place, screw into the posture board at all four corners.

ASSEMBLY OF THE UPPER BUNK TO THE LOWER BUNK

12. With two adults standing facing each other, one at the foot and the other at the head of the upper bunk, carefully lift the upper bunk over the lower bunk bed, and lower it slowly to engage securely with steel dowel pins (Part J). Do not release the bed until both ends are securely in place.

MATTRESS SPECIFICATIONS

13. This bed uses standard twin size mattresses, which are approximately 38" wide and 74" long. The thickness may vary.

THE MAXIMUM MATTRESS THICKNESS FOR USE WITH THIS BED IS 8 INCHES. THIS IS WHEN USED WITH A SEARS POSTURE BOARD THAT IS APPROXIMATELY 74 INCHES LONG X 37 1/2 INCHES WIDE X 1 1/2 INCHES THICK.

ATTACHMENT OF THE GUARDRAIL

14. Place the mattresses on the upper and lower beds.

15. TO HELP PREVENT A SLEEPING CHILD FROM INADVERTENTLY SLIDING UNDER OR ROLLING OVER THE TOP OF THE GUARDRAIL, THE FOLLOWING GUIDELINES MUST BE FOLLOWED:

16. THE TOP OF THE GUARDRAIL MUST BE SET AT LEAST FIVE INCHES ABOVE THE TOP OF THE MATTRESS.

17. THE BOTTOM OF THE GUARDRAIL MUST BE SET WITHIN ONE INCH OF THE TOP OF THE MATTRESS, UNLESS THE SPACE BETWEEN THE BOTTOM OF THE GUARDRAIL AND THE TOP OF THE SIDE RAIL IS 3 1/2" OR LESS.

18. THE FOLLOWING CHART GIVES REQUIRED SPACING. DETERMINE THE CORRECT MOUNTING HOLES TO USE BY THE THICKNESS OF THE MATTRESS.

Mattress Thickness	Holes From Top Of Post
5" or Less	3 - 5
5 1/2" to 6 1/2"	2 - 4
7" to 8"	1 - 3

19. Attach the guardrail (Part F) to the upper bunk bed ends (Part C & D), as shown. Use the 4 lag screw and washers provided (see illustration).

20. Securely tighten the guardrail lag screws until there is no space between the guardrail and bed ends, not between the lag screw head, steel washer and bed end. Do not over tighten.

21. To purchase an additional guardrail and mounting hardware, contact your local Sears unit and order Item #67504 Dark Pine or #67757 Light Pine.

22. Acquaint all children in your home with the new bunk bed and, again, emphasize the warnings given in these instructions, and on the warning labels affixed to the bunk bed.

ASSEMBLY AS TWO TWIN BEDS

1. Attach the side rails (Part E) to the bed ends (Part A & B and C & D) using the pre-drilled mounting holes and sixteen 1/4" x 4" lag bolts and flat washers, as provided (Part I).

IF USING A TRUNDLE STORAGE BOX ATTACH THE SIDERAILS USING THE UPPER SET OF HOLES (13 1/2" AND 16 1/2" FROM THE BOTTOM OF THE BED ENDS)

IF NOT USING A TRUNDLE STORAGE BOX ATTACH THE SIDERAILS USING THE LOWER SET OF HOLES (8 1/2" AND 11 1/2" FROM THE BOTTOM OF THE BED ENDS).

Do not fully tighten the bolts, leave about 1/2" between the bolt head and bed end surface until both siderails are attached.

2. When both siderails are attached securely tighten all bolts until there is no space between the end of the siderail and the bed end and no space between the bolt head, washer, and bed end. Do not overtighten.

3. Install two cross wires (Part G) on each bed. Seat the cross wire hook ends in the matching cutouts provided in the support flanges. These holes are approximately 17" from each end of the two siderails (Part E), as shown. Insert a #10 x 3/4" Phillips flat head screw (Part K) into each hook end. Adjust the position of the cross wires to give minimum sag. The wires should be taut. Then tighten securely in place. Do not overtighten.

4. Carefully place the posture board or bunkie on the siderail support flanges making sure both cross wires are in position and securely in place. Center the posture board evenly between the bed ends, also between the siderails. Insert the #9 x 2 1/4" Phillips flat head screws (Part L) from the under side through the pre-drilled holes in the side support flanges (Part E) approximately 5" from the end of the rail. While holding the posture board in place, screw into the posture board at all four corners.

5. Place the mattresses on the posture board.

BUNK BED ASSEMBLY INSTRUCTIONS AND CAUTIONS

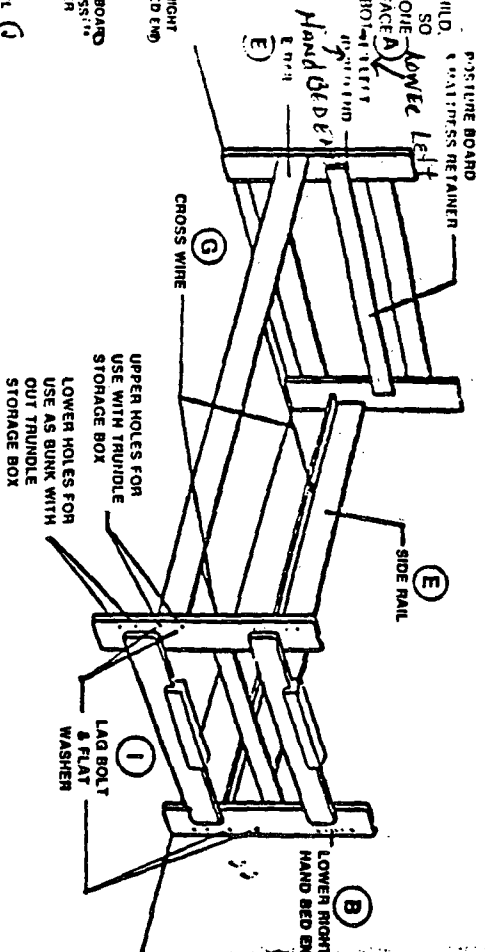
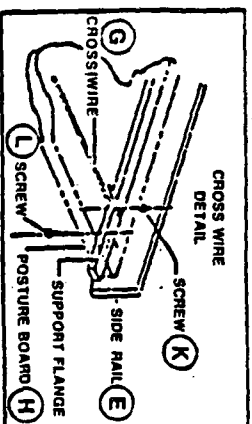
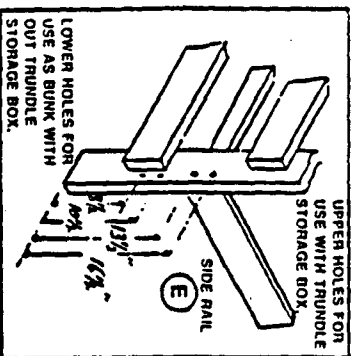
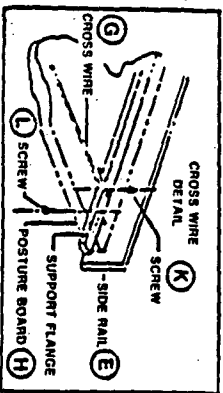
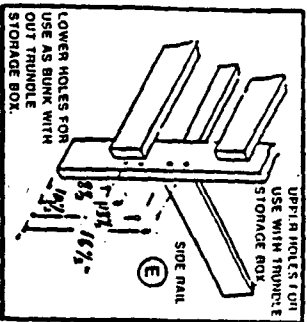
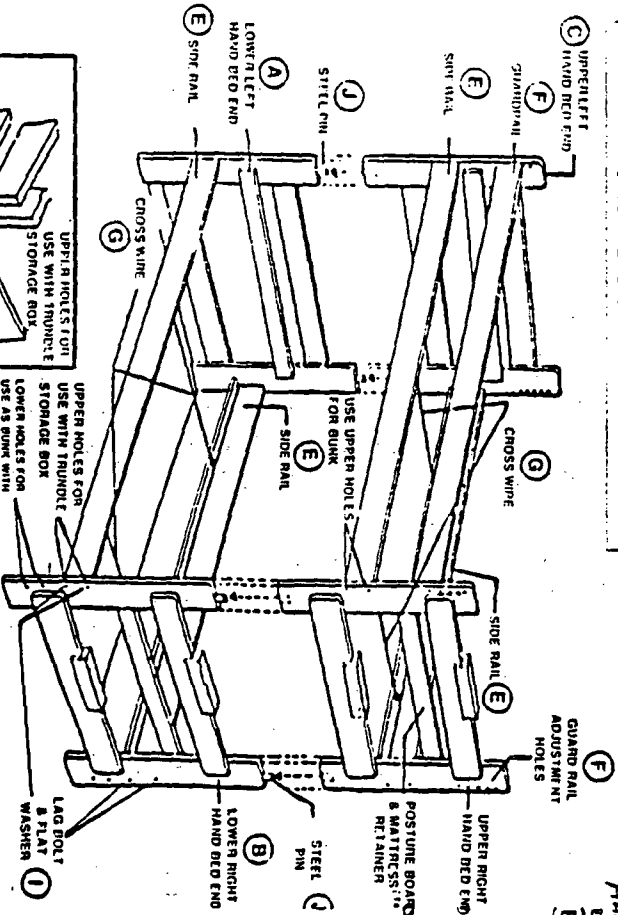
TWIN BED ASSEMBLY INSTRUCTIONS AND CAUTIONS

CAUTION

GUARDRAIL/MATRESS POSITION AND SIZE ARE IMPORTANT! FOLLOW WRITTEN INSTRUCTIONS WITH THIS BED IF NOT AGAINST WALL USE TWO GUARDRAILS PROHIBIT CHILDREN UNDER 6 YEARS ON TOP BUNK ALWAYS USE GUARDRAIL AND LADDER ENSURE ALL CONNECTORS ARE TIGHT PROHIBIT HUNG PLAY OR ON UPPER BED. DO NOT REMOVE THIS LABEL

CAUTION

FOR THE SAFETY OF YOUR CHILD, ASSEMBLE THE GUARD RAIL SO THAT THERE IS NO MORE THAN ONE RICH BETWEEN THE TOP SURFACE OF THE MATTRESS AND THE BOTTOM RAIL OF THE GUARD RAIL



776725-J1586

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE
SOLD BY SEARS ROBUCK & CO.
CHICAGO, ILLINOIS 60684

Page 6

CAUTION
WHEN THE BEDS ARE SET UP IN
TWIN BED CONFIGURATION, YOU
MUST INSTALL TWO CROSS WIRES
ON EACH BED.

776725-J1586

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE
SOLD BY SEARS ROBUCK & CO.
CHICAGO, ILLINOIS 60684

Page 7

KAREL OF CUMBERLAND

P.O. Box 38
NORTHBROOK, ILLINOIS 60065
PHONE (312) 498-5300

July 31, 1987

Mr. Todd A. Stevenson
FOIA Officer
U.S. Consumer Product Safety Commission
Washington, D.C. 20207

Re: CPSC letter of 7/24/87 requesting comments concerning
disclosure of information of Southern Furniture Market
Show trip of April 27th and 28th, 1987.
FOIA Request 5706035

Dear Mr. Stevenson,

We have received and reviewed the above letter and would like to comment as follows: We refer specifically to the paragraph about guardrails that notes Karel of Cumberland as an exception to the guidelines. The description of the merchandise is as reported, but we feel that it is in compliance with the guidelines as agreed upon and published by the Voluntary Inter-Industry Bunk Bed Standing Committee.

Please, refer to paragraph 3.5.4. which states- There shall be no openings in the rigid bed structure below the lower edge of the guardrail that would permit the free passage of a 3 1/2 inch cube in any orientation or the lower edge of the guardrail shall not be more than 1 inch from the mattress. These requirements shall be maintained when a lateral force of 33 lbF is applied to the center of the guardrail in an outward direction.

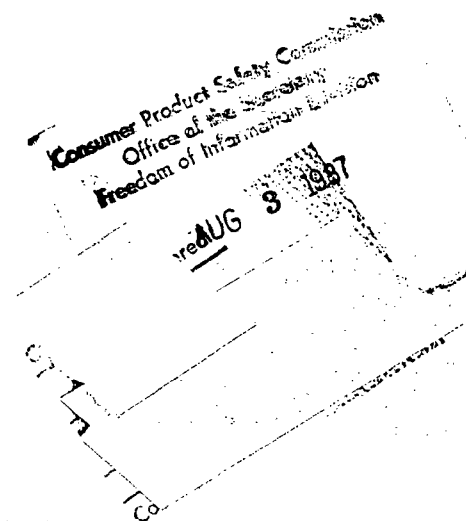
The main point being that there are two options. One being the less than 3 1/2" option and the other being the 1" between the mattress and the lower edge of the guardrail. This was discussed and agreed upon by the committee when the guidelines were established.

We feel that item #17 on page 4 of our instruction sheet covers this point.

If you decide to release the information requested, we feel strongly a copy of this letter be included.

We would like to be notified of any subsequent request prior to disclosure.

We are inclosing a copy of Fact Sheet 71 Bunk Bed issued in 1987 by the U.S. Consumer Product Safety Commission for review. We feel the two options should be incorporated into this Fact Sheet not just the 3 1/2" option.



If any additional information is needed, please call me.

Thank you for your consideration, we await your reply.

kindest Regards,



Robert M. Kupchick
President
Karel of Cumberland

RMK/des

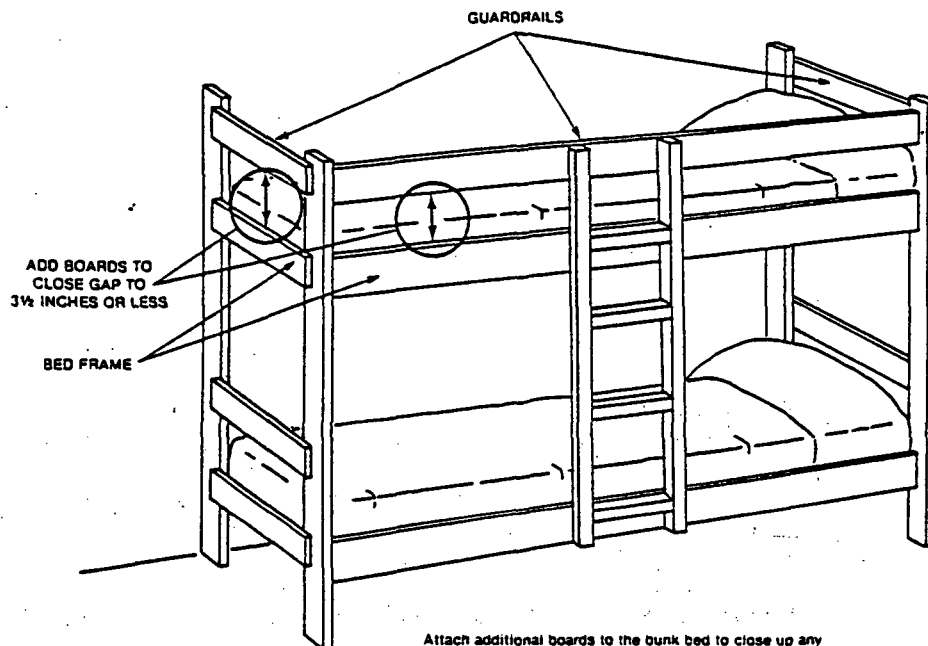
Fact Sheet 71 Bunk Beds

The U.S. Consumer Product Safety Commission estimates that over the last three years an average of 21,600 children under age 15 received hospital emergency room treatment each year for injuries associated with bunk beds. Most of these injuries were fairly minor and occurred when children fell from the beds. Rough play and other horseplay frequently contribute to these accidents. There are other less obvious potentially serious hazards associated with bunk beds. Below are illustrations of some serious accidents which have occurred.

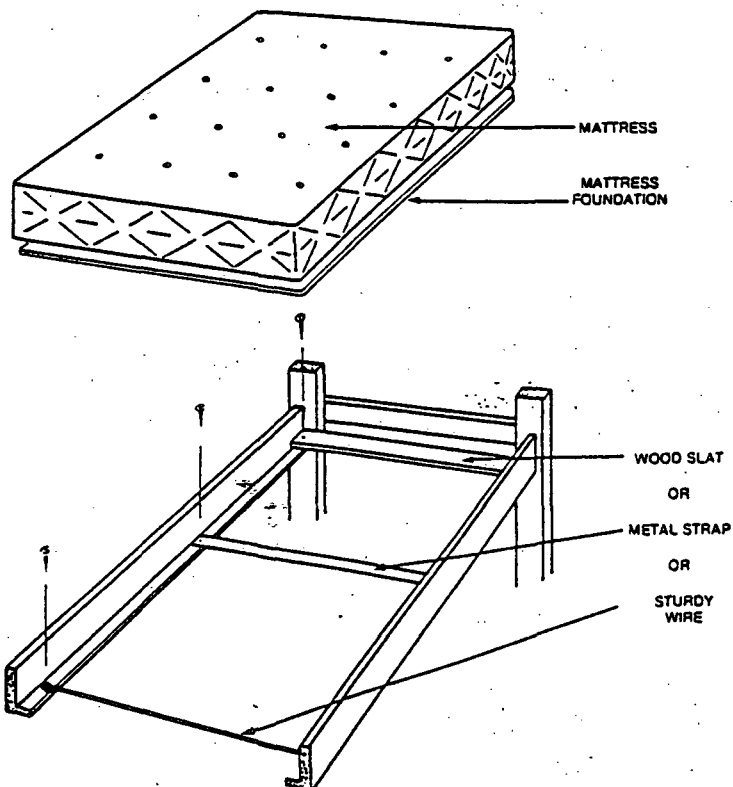
- A four-year old boy attempted to descend from the upper unit of his bunk bed by sliding down feet first underneath the guardrail. His body passed through the space between the mattress and guardrail but he became trapped by his head and suffocated.
- A 14-month-old child, who had been climbing out of her crib, had been put into a bunk which was being used in the twin bed configuration. This bed had a guardrail on the side away from the wall and the bed was pushed up against the wall. Her body slid into the space between the mattress and wall and she strangled.
- Two-year old twins were playing beneath one unit of a bunk bed set that was being used as a single bed. Apparently their activities caused one side of the mattress to drop from its supporting ledge. The mattress fell across the throat and chest of one of the twins and he suffocated.
- A four-year old child was placed in the top bunk to sleep. The bed was an extra long length, but the mattress was regular length. The child became entrapped in the space between the mattress and footboard. Fortunately she called out and was rescued before any serious injury or fatality occurred.

These incidents involved the following important factors:

1. **Guardrail spacing** — On some beds the space between the guardrail and the mattress is large enough that a young child can roll or slide between the mattress and guardrail or the side or end of the bed, leaving the child suspended by the head and entrapped. Since 1973, CPSC knows of 10 deaths which have occurred in this fashion. Guardrails which are attached to the structure of the bunk beds by hooks and remain in place by their own weight can become dislodged, which could also allow a child to become entrapped or fall.
2. **Use of the bed without rails on both sides** — Most bunk beds are used with one side located against a wall and are sold with only one guardrail to prevent falls from the side away from the wall. Since 1973, 11 deaths have occurred when very young children rolled off the bed and became entrapped in the space between the wall and the side of the bed which did not have a guardrail. This hazard is not unique to bunk beds in that regular beds present the same hazard.
3. **Mattress foundation became dislodged** — Some bunk beds may not have cross ties under the mattress foundation. Others may include them for only the upper unit. Cross ties can be wires, wood slats or metal straps and should be screwed or bolted to the frame to keep them in place. When mattress foundations merely rest on small ledges attached to the bedframe, they can fall onto a child on the floor or on the bunk below if a child pushes or kicks upwards on the mattress. To date the Commission is aware of 4 deaths which occurred in this manner.



Attach additional boards to the bunk bed to close up any gap more than three and one half inches between the lower edge of the guardrails and the upper edge of the bed frame to prevent possible entrapment and strangulation.



Fasten additional cross ties underneath the mattress foundation of both beds.

4. **Wrong size mattress** — Bunk bed structures and mattresses come in two lengths — regular and extra long. Extra long is 5 inches longer than regular. Therefore, if a regular length mattress is purchased for an extra long bed structure, there can be a 5 inch opening between the mattress and headboard or footboard in which a child can become entrapped.

The Commission has the following specific suggestions regarding the selection, safe use and maintenance of bunk beds:

1. Selection

Choose bunk beds that have:

- a. guardrails on all sides which are screwed, bolted or otherwise firmly attached to the bed structure. The space or opening between the bed frame and the bottom of the guardrails should be no greater than 3½ inches above the mattress to prevent a child from rolling out of the bed;
- b. cross ties under the mattress foundation which can be securely attached;
- c. a ladder that is secured to the bed frame so that it does not slip when the child climbs on it; and
- d. a feature which allows the bunk beds to be separated to form two single beds if you have children too young to sleep safely on the upper bunk bed.

In addition, be sure to select the correct length mattress for your bed structure. This is especially important when the bed structure and mattress are bought at different times, such as when a replacement mattress is purchased.

2. Use

- a. For very young children — do not permit them to sleep in the upper bunk.
- b. For older children — if the upper bunk is not against a wall, use guardrails on both side.
- c. Always use two side guardrails when the bed, in the twin configuration or as a lower bunk, is to be used as a child's first regular bed. Even when the bed is pushed against a wall, a young child may roll between the bed and wall, resulting in entrapment and possible suffocation.
- d. Be sure there are cross ties under the mattress foundation of each bed and that they are secured in place even if bunks are used as twin beds.
- e. Keep guardrails securely in place at all times no matter what age of the child, as children roll during sleep.
- f. Teach children that rough play is unsafe around and on beds and other furniture.
- g. Emphasize to children to use the ladder and not to use chairs or other pieces of furniture to climb into or out of the top bunk.
- h. Consider keeping a night light on so that children will be able to see the ladder if they need to get up during the night.

3. Maintenance

- a. If the space between the guardrails and the bed frame is more than 3½ inches, affix, by nails or

screws, another rail to close the space to prevent head entrapment.

- b. Keep the guardrail in good repair and screwed or bolted in place.
- c. Replace loose or missing rungs on the ladder.
- d. Repair or replace any loose or missing hardware, including cross ties.

To report a product hazard or a product-related injury, write to the U.S. Consumer Product Safety Commission, Washington, D.C. 20207, or call the toll-free hotline: 800-638-CPSC. A teletypewriter for the deaf is available on the following numbers: National 800-638-8270, Maryland only 800-492-8104.

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PRODUCT SAFETY, IT'S NO ACCIDENT



Memorandum

TO : Elaine Tyrrell, EX-PB
Through: Dr. Robert D. Verhalen, AED, Epidemiology

DATE: AUG 31 1987

FROM : Debbie Tinsworth, EPHA DKT

SUBJECT: Bunk Bed Injury Data

This memorandum provides information on bunk bed-related incidents, injuries, and deaths. It was requested for the CPSC staff evaluation of 1) the Voluntary Bunk Bed Safety Guidelines and 2) a petition submitted by the Consumer Federation of America(CFA), which requests the issuance of a mandatory safety standard for bunk beds.

Commission data files screened included the National Electronic Injury Surveillance System (NEISS), death certificates, in-depth investigations, consumer complaints, and newspaper clippings.

Injuries

Shown below are the estimated bunk bed-related injuries treated in U.S. hospital emergency rooms for years 1979 through 1986:

Table 1
Bunk Bed Injuries

<u>Year</u>	<u>Estimated Injuries</u>
1979	18,000
1980	20,800
1981	22,400
1982	24,300
1983	27,300
1984	28,400
1985	31,700
1986	30,500

Source: National Electronic Injury Surveillance System (NEISS)

While there was an apparent increase in estimated injuries, the year-to-year differences among all years were not statistically significant. Also, the role of possible changes in product usage during the 1979-1986 time period was not known.

In 1986, about one-third of the reported victims were under the age of five and about three-fourths were under the age of 15. About two-thirds of the victims were male. About two percent of the victims were hospitalized, as compared to about three percent for all injuries reported through NEISS in 1986, indicating that bunk bed-related injuries were somewhat less severe than most other product related injuries. From the one-line descriptive comment that is reported for each injury, almost all of these injuries resulted from victims falling from, bumping into, or jumping from bunk beds. Over one-half of these injuries were lacerations, contusions, and abrasions. An examination of the data showed similar victim characteristics and hazard patterns in previous years.

Deaths

As shown in Table 2, CPSC has received reports of 72 bunk bed-related deaths (non-fire related) involving children under the age of 15, from 1973 through June 1987. While these deaths do not represent a statistical sample or include all of the bunk bed-related deaths which occurred during this time period, they do indicate how serious incidents occur with this product.

Entrapment between the guardrail and mattress, through the end structure, through the foundation (due to an undersized mattress), and between the bed and the wall (including one incident involving entrapment between a bed and a crib), was reported to be associated with 28 deaths. Falls were reported to be involved in 19 deaths, becoming hung by a belt, rope, or clothing item which was caught on the bed in 12 deaths, and support failure in 4 deaths.

Overall, 32 of the 72 deaths reported (44 percent) involved children under the age of two. The proportion of very young victims was particularly high for the entrapment-related deaths, for which three-fourths of the victims were under age two.

Table 2.
Bunk Bed Deaths Involving Children Under Age 15,
Hazard Pattern by Age of Victim
(Excluding Fire Deaths)

<u>Hazard Pattern</u>	<u>Total</u>	<u>Age of Victim</u> <u>(In Years)</u>				
		<u>0-1</u>	<u>2-5</u>	<u>6-8</u>	<u>9-11</u>	<u>12-14</u>
<u>Total</u>	<u>72</u>	<u>32</u>	<u>21</u>	<u>5</u>	<u>8</u>	<u>6</u>
<u>Entrapment</u>	28	21	7	-	-	-
Guardrail	(10)	(5)	(5)	-	-	-
End Structure	(2)	(2)	-	-	-	-
Foundation	(1)	(1)	-	-	-	-
Wall/Other*	(15)	(13)	(2)	-	-	-
<u>Support Failure</u>	4	2	1	1	-	-
<u>Falls</u>	19	3	10	3	2	1
<u>Hung by Belt,</u> <u>Rope, Clothing,</u> <u>etc.</u>	12	1	1	1	6	3
<u>Other or Unknown</u>	9	5	2	-	-	2

* One incident involved an entrapment between a crib and a bunk bed.

Source: CPSC In-Depth Investigation, Death Certificate,
and Reported Incident Files, 1973-June 1987.

U.S. Consumer Product Safety Commission/EPHA

Entrapment

Because entrapment-related issues appeared to be of particular concern to the Petitioner and were the subject of many staff comments related to the Voluntary Bunk Bed Safety Guidelines, EPHA reviewed CPSC data bases for additional, non-fatal, incidents involving this hazard. Table 3 presents the location of entrapment and the age of the victim involved for the fatal and non-fatal incidents identified. Again, this is neither a complete count nor a statistical sample of all such cases during the 1973 through June 1987 time period; however, they give examples of how entrapment incidents occur.

Among these cases, the most frequently reported hazard was entrapment under the guardrail, with 54 incidents, including 10 deaths. The majority of these incidents occurred on the top bunk. Some incidents occurred, however, when the upper bunk (equipped with a guardrail) was being used as a twin bed. While the majority of these victims were in the 2-5 year age group, incidents for victims in the 0-1 age group were more often reported as fatal.

Entrapment between the bed and wall (in one case, between a bed and a crib) was the second most frequently reported hazard (17 incidents), and the highest in the number of deaths reported (15). While all of the victims were three years of age or younger, most were one year or less. In most cases, it was not known whether the victim was in the top or bottom bunk. It should be noted that while this hazard had the highest proportion (as well as number) of reported deaths, it is possible that this type of incident may not always be perceived as product-related and therefore may not have been reported to CPSC unless a death occurred.

Entrapment in the end structure of the bed was reported to have been involved in 14 incidents, including 2 deaths. These incidents occurred in both the top and bottom bunks, as well as bunks used in the twin configuration. Most of the victims were in the 2-5 age group, although both fatalities involved one-year olds.

Four children became entrapped through the mattress foundation (i.e., between the mattress and bed structure), most likely because of an undersized mattress. While 3 of the 4 incidents involved the top bunk, the one fatality (a one-year old) involved the bottom bunk.

Discussion

Entrapment has been the most frequently reported cause of bunk bed-related deaths since 1973, accounting for 28 of the 72 non fire-related fatalities. If non-fatal as well as fatal incidents are considered, the majority of incidents occurred in the 2-5 year age group; however, the majority of deaths (21 of the 28) involved children one year of age or less (all entrapment deaths involved children under age six). The very young victims, one year of age or less, were most frequently reported to have died when they became entrapped between the bed and the wall. Where such information was reported, about 80 percent of all entrapment incidents involved the top bunk.

In examining these entrapment hazards, it is clear that some of the deaths were bed-related, rather than specifically bunk bed-related. For example, in an August 1986 data review for the Structural Entrapment Project, there were 11 deaths reported to CPSC which involved entrapment between a bunk bed and a wall and 86 deaths between a regular bed or mattress and a wall. Thus, deaths reported from entrapment between bunk beds and walls were about 11 percent (11/97) of the total. With bunk beds being about 10 percent of all household beds in use, the proportion of these reporting deaths from entrapment between bunk beds and walls was about the same as the proportion of bunk beds in use. Of the total deaths reported from all bed-entrapment hazards, 22 were with bunk beds and 185 were with other beds. Bunk beds were therefore, reported to have been involved in about 10 percent (22/207) of these entrapment deaths, again about the same as the proportion in the total household bed population. From these data, it appears that bunk beds may be no more hazardous than other beds in terms of some entrapment hazards. Further comparison of bunk bed injuries to injuries for other beds is provided in the Appendix to this memorandum.

For other hazard patterns, particularly those involving falls or hangings, there were few details available about how the deaths occurred, and there was no clear relationship between victim age and the type of accident pattern involved.

Attachment

Table 3.
Bunk Bed Entrapment Incidents
Location of Entrapment by Age of Victim

<u>Location</u>	<u>Age of Victim</u> <u>(In Years)</u>				
	<u>Total</u>	<u>0-1</u>	<u>2-5</u>	<u>6-8</u>	<u>unknown</u>
<u>Total</u>	89(28) <u>a/</u>	22(21)	54(7)	11(-)	2(-)
<u>Guardrail</u>	54(10)	5(5)	38(5)	9(-)	2(-)
Top Bunk	42(8)	3(3)	31(5)	7(-)	1(-)
Bottom Bunk	--(-)	--(-)	--(-)	--(-)	--(-)
Bunk Used as Twin	4(1)	1(1)	3(-)	--(-)	--(-)
Unknown	8(1)	1(1)	4(-)	2(-)	1(-)
<u>End Structure</u>	14(2)	3(2)	10(-)	1(-)	--(-)
Top Bunk	5(-)	--(-)	4(-)	1(-)	--(-)
Bottom Bunk	5(1)	1(1)	4(-)	--(-)	--(-)
Bunk Used as Twin	2(-)	1(-)	1(-)	--(-)	--(-)
Unknown	2(1)	1(1)	1(-)	--(-)	--(-)
<u>Foundation</u>	4(1)	1(1)	2(-)	1(-)	--(-)
Top Bunk	3(-)	--(-)	2(-)	1(-)	--(-)
Bottom Bunk	1(1)	1(1)	--(-)	--(-)	--(-)
Bunk Used as Twin	--(-)	--(-)	--(-)	--(-)	--(-)
Unknown	--(-)	--(-)	--(-)	--(-)	--(-)
<u>Wall/Other</u>	17(15)	13(13)	4(2)	--(-)	--(-)
Top Bunk	4(4)	2(2)	2(2)	--(-)	--(-)
Bottom Bunk	--(-)	--(-)	--(-)	--(-)	--(-)
Bunk Used as Twin	--(-)	--(-)	--(-)	--(-)	--(-)
Unknown	13(11)	11(11)	2(-)	--(-)	--(-)

a/ Numbers in parentheses represent subset of incidents which involved fatalities.

Source: CPSC In-Depth Investigation, Death Certificate, and Reported Incident Files, 1973-June, 1987
U.S. Consumer Product Safety Commission/EPHA

APPENDIX
Injuries and Deaths Associated with Bunk Beds as
Compared to Those with Beds, NS

	<u>Product</u>	<u>Comparable Products</u>
Product Name	<u>Bunk Beds</u>	<u>Beds, NS^{a/}</u>
Estimated	30,470	206,175
Frequency of Injury (NEISS, 1986)	(22,260 < 15)	(125,440 < 15)
Sample Size	475	3,343
Rate per 100,000 Population ^{b/}	42.8 per 100,000 < 15	241.3 per 100,000 < 15
Number of Deaths ^{c/} (1973-7/1987)	about 5 per yr (72)	about 40 per yr (570)
Most Frequent Patterns	Injuries: 0 Falling from 0 Bumping into 0 Jumping from Deaths: 0 Entrapment 0 Falling 0 Hanging	Injuries: 0 Falling from 0 Bumping into Deaths: 0 Falling 0 Entrapment 0 Suffocation in bedclothes or under other persons in bed

^{a/} Data in this group were reported through NEISS product code 0694, beds not specified. Because the types of beds were not identified for these cases, it is possible that some bunk beds, cribs, or other products which aren't conventional beds were included in this category.

^{b/} Unadjusted population based rate, does not consider number of products in use, frequency of use, or hours of use associated with each product.

^{c/} Number of deaths were obtained from CPSC Death Certificate, In-Depth Investigation and Reported Incident Files. Fire deaths were excluded. Please note that in some cases, particularly for beds, NS, the relationship between the product and death may be tangential (e.g., infant fell off bed onto sharp toy). Further analysis would be required to refine these data.

Source: National Electronic Injury Surveillance System
(NEISS), 1986
CPSC Death Certificate, In-Depth Investigation and
Reported Incident Files, 1973-July, 1987

U.S. Consumer Product Safety Commission/EPHA

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

JUL 22 1987

TO : David W. Thome, OPMB
Through: David Schmeltzer, Associate Executive Director, CACA
Through: Carlos L. Perez, Acting Director, CACA
FROM : Renae Rauchschalbe, Compliance Officer, CACA

SUBJECT: CACA Activities Related to Bunk Beds

Per your request for information regarding CACA activities related to bunk beds, I have provided the following summary.

Prior to 1984, CACA had opened two Section 15 files involving bunk beds. One of these concerned weld failures and the other involved cleats intended to support a box spring and mattress separating from the side rails.

In 1984 the staff initiated an investigation of the death of a two-year-old boy due to a bunk bed mattress and mattress support falling on him. While reviewing CPSC data sources for this investigation, CACA staff noted a number of other injury patterns related to bunk beds, particularly structural entrapment incidents, sometimes resulting in suffocation or strangulation. These problems appeared to be industry wide. The CACA investigation was closed in June 1984, and in a memorandum dated July 10, 1984, CACA forwarded a recommendation to the Office of Program Management that an effort be made to initiate a voluntary standard for bunk beds.

In 1986, following a report of a second death due to mattress and mattress support collapse of the same distributor's bunk bed, a Section 15 file was opened. A corrective action plan was proposed by the firm and approved by the Commission.

CACA requested field establishment inspections of several firms to determine if they distributed bunk beds with similar mattress support systems that could present the same hazard and risk of injury. In response to consumer complaints, the field staff also initiated investigations of other bunk bed manufacturers. Staff determined that eight out of fifteen cases investigated did not require corrective action and, therefore, either closed or are about to close the files. In a ninth case, CACA requested prospective corrective action and closed the file. Corrective action has been taken or is being sought on the remaining six files.

Since 1983, nine investigations have been initiated and closed involving entrapment hazards.



U.S. CONSUMER PRODUCT SAFETY COMMISSION

DIRECTORATE FOR ECONOMIC ANALYSIS

Market Sketch: Bunk Beds

Terrance R. Karels
Economic Analysis

September 1986

WASHINGTON, D.C. 20207

MARKET SKETCH: BUNK BEDS

Bunk beds have been in domestic use for several generations. They are essentially stackable twin beds. Bunk beds are constructed of a wood or metal frame and headboard, with a guardrail for the top bunk. Trade sources estimate that bunk beds experience an expected useful life of 13-17 years, similar to that of other bedroom furniture. Based upon this estimate and estimates of annual sales, we expect that there are perhaps 7-8 million bunk beds in household use. Bunk beds may account for some 10-15% of all beds in household use.

Manufacturers

Virtually every manufacturer of bedroom furniture is a potential producer of bunk beds, since the bulk of the units sold are relatively easy to manufacture. Through trade sources, we have identified 77 firms which manufacture or import these products. All of these manufacturers produce a line of furniture, and are not wholly dependent upon the sale of bunk beds. There are possibly hundreds of smaller, garage-type manufacturers of bunk beds, producing small numbers of bunk beds for limited markets, which have not been identified.

Industry sources indicate that about 40 firms account for 75-85% of annual sales: Of these, 25 are members of the American Furniture Manufacturers Association (AFMA), the major trade association for the furniture industry. The percent of sales accounted for by AFMA members is not available.

Bunk bed manufacturers are located throughout the U.S., with particular concentration in the South. This area has been traditionally the location of most wood furniture manufacture.

Production

Bunk beds are not specifically broken out in official U.S. trade statistics, but are included in "basket" categories for wood or metal household furniture. U.S. production falls under two SIC codes: wood household furniture (2511), and metal household furniture (2514). Information on employment, value added, and concentration are reported in terms of these superior headings, and are not available for smaller segments of the categories.

The trade association does not have complete information on production and sales. However, the trade group estimates that 450,000-500,000 units are sold annually, and has reported that the market for the product has been relatively stable over the past decade. The retail value of shipments has been put at \$75-175 million. Our preliminary estimates indicate that bunk beds may represent as much as 15% of annual bed shipments.

Prices

Bunk beds retail for about \$100-\$700, depending upon the materials of construction and whether the mattresses are included. Shipment estimates indicate that a "typical" unit would retail for about \$275. Intermediate prices are not available, but we expect that the units are subject to mark-ups similar to those of other bedroom furniture: 50-150%.

Distribution

Bunk beds are sold at retail, either through traditional furniture stores or through furniture outlets. The units also are available through department stores and by mail order. Manufacturers sell directly to retailers, or may operate through

wholesalers in certain regions. Larger volume furniture purchasers may also require that manufacturers produce the items to specification, for sale under the retailer's private label.

Imports

U.S. imports of bunk beds are also included in trade "basket" categories: furniture of wood, not specifically provided for (727.3540) and other furniture and parts, not specifically provided for (727.5560). While total imports for these categories are large, industry sources report that imports of bunk beds are insignificant relative to domestic production. The imported units are shipped k-d, or "knocked-down," for assembly by the retailer or the consumer. Trade sources indicate a recent trend in importation of these products: shipments of parts to domestic manufacturers for U.S. assembly. This trend is expected to increase in the future.

The leading exporters of bunk beds to the U.S. are Canada, Taiwan, Brazil, and the Scandinavian countries. These countries also are among the leading exporters of parts, along with Malaysia, Yugoslavia, and possibly Romania.

Memorandum

TO: David Thome, OPMB
THRU: Paul H. Rubin, AED/EC *PH~*
FROM: Dale R. Ray, ECPA *DRR*
SUBJ: Bunk Bed Petition: Cost/Benefit Issues

September 23, 1987

To grant the CFA petition on bunk beds, the Commission must preliminarily determine that an unreasonable risk may exist. This involves having some evidence to suggest that potential benefits of any resulting rule are reasonably related to its likely costs. Since we do not have a very clear idea of what a standard would look like, the benefits and costs cannot be estimated precisely. We can, however, estimate the costs of remedies that might be economically efficient in eliminating or reducing the entrapment hazards discussed in the petition.

Epidemiology has identified 15 wall/bed entrapment deaths and 12 guardrail/end structure entrapment deaths associated with bunk beds since 1973, or about one per year for each of these two principal hazards. At a statistical value of \$2 million per fatality, the annual cost of each of these hazards would be \$2 million. For a population of about 8 million bunk beds in use, this cost is about \$.25 per unit (i.e., per two-person bed). Over the 15-year estimated usage period of bunk beds, the present value of the accidents, discounted at 5%, is \$2.75 per unit for each hazard.

We have no data on the exact cost to consumers of the remedies for these hazards--perhaps an extra rail to prevent wall/bed entrapment and different spacing to prevent guardrail/end structure entrapment. Many bunk beds now offer second rails, either standard or as an option: these are at least \$10 (and up to about \$20) more at retail than comparable single-rail models. Seen another way, if the cost of extra rails were roughly \$10 per unit, the cost per life saved would be $10/2.75=3.64$ times the illustrative \$2 million figure, or about \$7.3 million, if the remedy were fully effective. Extra rails could also prevent some injuries from falls (e.g., to very small children), but we have no measure of this potential benefit. We do not know whether redesigns incorporating narrower spacing could be achieved for less than \$2.75 per unit, though this may be practical if done as part of a normal or scheduled design change.

From this preliminary look at the data we have, it appears that the benefits of a bunk bed standard addressing wall/bed entrapment might not be reasonably related to its costs. We will continue to investigate the potential costs and benefits of Commission actions in accordance with the upcoming decision on the petition.

Memorandum

To : Elaine Tyrrell, Project Manager, Children's and
Recreational Products Program, OPMB

15 SEP 1987

From : Paul H. Rubin, AED, Economic Analysis PH
Robert Frye, Acting AED, Epidemiology B

Subject: Recommendation on Bunk Beds

Before discussing our individual recommendations, it is important to note that there is little evidence that bunk beds are a major hazard. Over the entire history of the Commission, we know of 28 deaths from entrapment with these products and, while each death is tragic, nonetheless this is a relatively small number. More importantly, 21 of these deaths involve children under two years of age. The Children's Team has recommended in a safety alert that children below age two should not be placed on such beds.

The industry recommends that children less than 6 years of age should not be placed in the top bunk. Of the 15 cases for which the location was known, 12 were children under 6 who were in the upper bunk. Thus, most of these deaths occurred when the beds were being used in a manner contrary to current manufacturer recommendations. The CPSC staff's recommended changes to the industry guidelines could thus unnecessarily increase costs and reduce design options.

In examining these entrapment hazards, it is clear that some of the deaths were bed-related, rather than specifically bunk bed-related. For example, in an August 1986 data review for the Structural Entrapment Project, there were 11 deaths reported to CPSC which involved entrapment between a bunk bed and a wall and 86 deaths between a regular bed or mattress and a wall. Thus, deaths reported from entrapment between bunk beds and walls were about 11 percent (11/97) of the total. With bunk beds being about 10 percent of all household beds in use, the proportion of these reported deaths from entrapment between bunk beds and walls was about the same as the proportion of bunk beds in use. Of the total deaths reported from all bed-entrapment hazards, 22 were with bunk beds and 185 were with other beds. Bunk beds were therefore, reported to have been involved in about 10 percent (22/207) of these entrapment deaths, again about the same as their proportion in the total household bed population. From these data, it appears that bunk beds may be no more hazardous than other beds in terms of some entrapment hazards. Further comparison of bunk bed injuries to injuries for other beds is provided in the Appendix to D. Tinsworth's memo on Bunk Beds dated August 31, 1987.

We would not want to argue that bunk beds are safer than other beds. Rather, the point is that they are about like other beds and therefore it is difficult to justify more stringent regulation for bunk beds than for beds.

Two of the specific hazard patterns are so infrequent as to be not worth addressing. Entrapment between the mattress and the bed structure has led to only one known fatality, and entrapment in the end structure has led to only two known fatalities, over the past fourteen years.

Overall, this hazard seems to us too small for CPSC to recommend an ANSI or ASTM proceeding. It is also in our view inappropriate to consider an ANPR for this product.

There is evidence that 21 of the 28 known entrapment deaths were to children less than 2 years old. A compromise might be to suggest a label warning against any use of bunk beds by children less than 2 years old. In fact, this caution and the one against children under 6 in the top bunk might be sufficient. A long list of Cautions such as that on p. 4 of the voluntary guidelines (Tab B) will probably lead consumers to disregard our cautions and warnings on truly dangerous products such as ATVs or methylene chloride. Also, a smaller number of cautions are more likely to be heeded; too long a list leads to the "Everything causes cancer" syndrome. Keeping children below 2 out of these beds and children under 6 out of the top bunk would probably solve most of the problem.

Memorandum

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : Elaine A. Tyrrell, Project Manager, OPMB

FROM : Robert D. Verhalen, *RV* Dr. PH, Acting Director
Office of Program Management and Budget

SUBJECT: CFA Petition on Bunk Beds

DATE: SEP 17 1987

The alternatives presented to the Commission on the subject petition are to grant or deny the CFA petition to promulgate a mandatory standard aimed at three problems associated with bunk beds. OPMB recommends the petition be denied for the following reasons:

- o The problem of mattress supports has already been remedied by the Commission.
- o The hazard of space between guardrails and mattress has been documented as having resulted in 13 deaths over the past fourteen and a half years, less than one per year.
- o The third problem involves entrapment between the bed and a wall (or other non-bed structure). This has been documented as involved in 15 deaths over the past fourteen and a half years.

While any death is tragic, these last two risks seem relatively small when compared to others faced by children in today's world. More than 350 children below age 15 die each year in swimming pools for example, and approximately 125 children below age 5 die each year from playing with cigarette lighters.

Perhaps even more relevant is the fact that entrapment between the bed and a wall is not a problem unique to bunk beds. Bunk beds are involved in deaths from this hazard roughly in proportion to their use in the general population, e.g., about 10% of beds in use are bunk beds and about 11% of deaths from entrapment between a bed and a wall involve bunk beds. This proportion remains roughly the same when all entrapment mechanisms are considered. That is, approximately 10 percent of all bed related entrapment deaths involve bunk beds.

These data do not mean that bunk beds are safer than other kinds of bed, only that they are no worse. It seems inappropriate then to suggest more stringent regulations for bunk beds than for regular beds. The industry currently recommends that the top bunk should not be used for children below age 6.

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : Elaine A. Tyrrell, Project Manager, EXPB September 24, 1987

FROM : William W. Walton, AED, ES W³

SUBJECT: CFA Petition on Bunk Beds, CP 86-2

Engineering recommends that the Commission grant the petition and issue an ANPR for bunk beds for the following reasons.

1. The Directorate for Epidemiology has indicated that there have been a minimum of 72 bunk bed related deaths to children in approximately 14 years; it is likely that there have been more.
2. Entrapment has been the most frequently reported cause of bunk bed related deaths. Engineering and Human Factors staff have continuously pointed out that the industry guidelines do not adequately address this hazard pattern. One which we believe could be addressed at minimal cost.
3. Bunk beds are specifically used by children, an especially vulnerable population whose safety has always been given high priority by the Commission. It has been argued that there are also accidents associated with other beds. We know, however, that children will always be the primary users of bunk beds.
4. Some of the deaths have been to children under six years old even though the industry recommends against use by children under six. Clearly, this is foreseeable behavior and if these deaths can be prevented at a modest cost, the industry would probably choose to do so.
5. It is also my opinion that minimal staff resources would be required to promulgate a mandatory rule for bunk beds, since much of the background work necessary to support such an action has already been accomplished in the staff evaluation of the provisions in the guidelines.

Finally, I note that the IIBBC has not formally been contacted by either Commission staff or any Commissioners with a request to respond to the staff's suggestions to improve the effectiveness of certain provisions in the guidelines and to publish them as a voluntary standard through the consensus process. The Commission may wish to formally contact AFMA with such a request and await their response prior to voting on whether to grant or deny the petition.

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : Elaine A. Tyrrell, Project Manager
Children's & Recreational Products Program

9/24/87

Through: Andrew G. Ulsamer, Ph.D., AED/HS AGO

FROM : ~~for~~ Warren K. Porter, Director, HSHL AGU

SUBJECT: CP-86-2-Bunk Beds

Based on our review of the briefing package on bunk beds, Health Sciences supports the option of granting the CFA petition. A total of 72 deaths involving bunk beds have been reported for the period 1973 through 1986 or approximately 6 deaths/year. Since these are anecdotal reports, the actual number may be higher. There were additionally over 600 injuries in 1986 that required hospitalization. This is a level of death and injury that should be addressed if reasonable fixes are available.

It is difficult to tell from the data presented in TAB D whether bunk beds are indeed more dangerous than conventional beds. The only comparison provided is for bed to wall entrapment where the risk of injury seems similar for the two types of beds. However, examination of the data presented for bunk beds on bed to wall entrapment shows that for all 4 deaths where the location of the accident is known, the upper bunk and not the lower was involved. While the numbers are small, this suggests that the factors involved in the accidents may be different for the two types of beds. Injuries related to structural failures, hanging, guardrail entrapment and falls would seem to be more related to bunk beds and/or more likely to occur with bunk beds.

The petition cites three hazards, only one of which, mattress supports, is adequately addressed in the current guidelines. The other two hazards, entrapment between the mattress and the guardrail and between the bed and the wall have one or more deficiencies. There are additionally two other entrapment hazards identified by staff, but not mentioned in the CFA petition: entrapment between the mattress and bed structure, and entrapment or falls associated with end structures of the upper bunk. All of these hazards should be addressed if the petition is granted.

In conclusion, there are hazards associated with bunk beds that cause death and injury to children. These hazards are not adequately addressed by existing guidelines and the petition should therefore, in our opinion, be granted. This recommendation assumes that a reasonable relation exists between costs and benefits as stated by the OGC guidance memo.

UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : David W. Thome, Acting Program Manager -- Emerging Hazards
Office of Program Management & Budget
September 24, 1987

FROM : Ross L. Koeser, Acting AEDFO *KOB & RK.*

SUBJECT: Bunk Beds Briefing Package

Field Operations' recommends the Commission grant the Consumer Federation of America (CFA) petition requesting the Commission to issue a Consumer Product Safety Standard for bunk beds. We make this recommendation for the following reasons:

1. Bunk beds pose three different risks of injury; two of which are entrapment (space between guardrails and the mattress and space between bed and the wall), and inadequate mattress supports which can allow the mattress to fall to the bunk below or to the floor.
2. The staff is aware of 72 bunk bed related deaths involving children under the age of 15, from 1973 to June 1987. Twenty-eight deaths are reported to be associated with entrapment. All entrapment deaths involved children under the age of 6.
3. Most CPSC Staff members who have reviewed the industry's Voluntary Bunk Bed Safety Guidelines have reservations whether the guidelines adequately address the hazards referenced in the CFA petition.

Field Operations believes there may be one or more unreasonable risks of injury associated with bunk beds, and that the existing guidelines may not eliminate or adequately reduce the risk of injury associated with bunk beds.

If the Commission decides to deny the petition, we believe that, at a minimum, the Inter-Industry Bunk Bed Committee should submit the guidelines to a recognized voluntary standards organization to be developed as a voluntary standard through the consensus process.

Sept. 22, 1987

TO: Dave Thome
FROM: Dave Shiflett
RE: Bunk beds



The Office of Information and Public Affairs, while generally opposing excessive regulation, votes to grant the petition. Whereas riding ATVs and tossing lawn darts involve risk, going to bed is thought to be a safe activity, which it generally is. Though bunk beds may not be involved in a large number of consumer deaths, they apparently could be fine-tuned and made even safer. We are not compelled to believe there is a good reason not to make every effort in this regard.

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UNITED STATES GOVERNMENT

MEMORANDUM

U.S. CONSUMER PRODUCT
SAFETY COMMISSION
WASHINGTON, D.C. 20207

TO : David W. Thome, Acting Program Manager
Emerging Hazards, OPMB *DS* SEP 22 1987

Through: Robert Verhalen, Dr. PH, Acting Director
Office of Program Management and Budget (OPMB)

FROM : *DS* Douglas L. Noble, Acting Associate Executive Director
Directorate for Compliance and Administrative Litigation

SUBJECT: CA Recommendation to Grant Petition to Promulgate
Mandatory Standards for Bunk Beds

There has been significant attention paid in the past by the Commission to hazards associated with bunk beds. The CPSC staff has attempted to deal with these hazards both on a retrospective and prospective basis.

Current Commission information indicates that as many as seventy-two (72) deaths, to children under the age of fifteen (15) years, have been associated with bunk beds in reports covering the period 1973 to 1987. In addition to the tragedy of these young lives being cut short, the Commission staff estimates that over thirty-thousand (30,000) injuries associated with bunk beds were treated in U.S. hospital emergency rooms in 1986. Moreover, staff estimates that there are 7-8 million bunk beds in use and annual sales of the product amounting to over 450,000 units.

Severity of injuries, given that deaths have occurred, appears to be high. Frequency of injuries also appears to be high. Children, a population group previously identified by the Commission as "vulnerable" to product related injuries, are particularly at risk. Probability of exposure also seems high given the numbers of products in use and those sold annually.

Granting the petition and establishing the project is therefore strongly recommended. At the end of the project, the staff would present the Commission with options to address the hazard. These options could, of course, include a decision to issue an Advance Notice of Proposed Rulemaking.