

**Final Rule
Bunk Bed
Safety Standard**

Wednesday
December 22, 1999

Part III

**Consumer Product
Safety Commission**

16 CFR Parts 1213, 1500, and 1513
Safety Standard for Bunk Beds; Final
Rule

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Parts 1213, 1500, and 1513

Safety Standard for Bunk Beds

AGENCY: Consumer Product Safety Commission.

ACTION: Final rules.

SUMMARY: The Consumer Product Safety Commission (CPSC or Commission) has determined that unreasonable risks of injury and death are associated with bunk beds that are constructed so that children can become entrapped in the beds' structure or become wedged between the bed and a wall.

This document issues the final rules mandating bunk bed performance requirements to reduce this hazard. The rules are issued under both the Federal Hazardous Substances Act (FHSA), for bunk beds intended for use by children, and the Consumer Product Safety Act (CPSA), for bunk beds not "intended" for (but often used by) children.

DATES: These rules will become effective June 19, 2000 and will apply to all bunk beds manufactured in the United States, or imported, on or after that date.

ADDRESSES: Documents relating to these rules can be obtained from the Office of the Secretary, Consumer Product Safety Commission, Washington, D.C. 20207-0001, or inspected at the Office of the Secretary, Consumer Product Safety Commission, Room 502, 4330 East-West Highway, Bethesda, Maryland; telephone (301) 504-0800.

FOR FURTHER INFORMATION CONTACT: Pamela Major, Office of Compliance, Consumer Product Safety Commission, Washington, D.C. 20207; telephone (301) 504-0608, ext. 1373; email pmajor@cpsc.gov.

SUPPLEMENTARY INFORMATION:

A. Background

In this document, the Commission issues rules mandating requirements to protect against the entrapment of children in bunk beds.¹ Without proper guardrails and safe dimensions for openings in the bed's structure, a bunk bed may allow a child to be entrapped, and thus strangle or suffocate. This can occur when the child becomes wedged between the bed and the wall, when the child slips his or her torso through an opening in the bed that is too small for its head to pass through (torso-first

entrapment), or when the child places his or her head in an opening, then moves to a narrower area of the opening where the head cannot pull out, and then falls or loses his/her footing (head-first entrapment).

There is a voluntary standard for bunk beds, ASTM F1427-96, that contains provisions to protect children from entrapment. The ASTM standard requires:

- Guardrails on both sides of the upper bunk, except for up to 15 inches at each end of the bed. The upper edge of the guardrails shall be no less than 5 inches above the top surface of the mattress when a mattress of the maximum thickness specified by the bed manufacturer's instructions is on the bed. Guardrails shall be attached so that they cannot be removed without either intentionally releasing a fastening device or applying forces sequentially in different directions.

- That openings in the structure surrounding the upper bunk be small enough to prevent passage of a tapered block having a base measuring 3.5 inches by 6.2 inches.

- That openings in the end structures within 9 inches above the sleeping surface of the lower bunk mattress be either small enough to prevent passage of the 3.5 by 6.2 inch block or large enough to permit passage of a 9-inch diameter sphere (the space needed to withdraw a child's head).

• Labels and instructions.
Because of continued reports of deaths and other incidents associated with entrapment in bunk beds, and because of indications there might not be adequate compliance with the voluntary ASTM standard, the CPSC published an advance notice of proposed rulemaking (ANPR) to begin a rulemaking proceeding that could result in performance or other standards to address the risk of entrapment associated with bunk beds.² 63 FR 3280 (January 22, 1998); 64 FR 3456 (January 22, 1999) (extension of time to issue proposed rule). After considering the comments received in response to the ANPR, the Commission voted 2-0-1³ to publish a notice of proposed rulemaking (NPR) to propose a new 16 CFR Part 1213 under the Consumer Product Safety Act (CPSA) and a new 16 CFR Part 1513 under the Federal Hazardous Substances Act (FHSA). 64 FR 10245

²The ANPR was approved by a 2-1 vote of the Commission. Chairman Ann Brown and Commissioner Thomas H. Moore voted to approve the ANPR; Commissioner Mary Sheila Gall voted not to publish the ANPR.

³Chairman Ann Brown and Commissioner Thomas H. Moore voted to publish the NPR; Commissioner Mary Sheila Gall abstained.

(March 3, 1999); 64 FR 14158 (March 24, 1999) (notice of opportunity for presentation of oral comments). The entrapment provisions of these two rules are identical. As discussed below in Section E of this notice, the CPSC rule addresses hazards associated with adult bunk beds (those not specifically intended for use by children, although they are often used for that purpose), and the FHSA rule addresses hazards associated with bunk beds intended for use by children.

After the original proposal, discussions at ASTM meetings indicated that requirements in addition to those originally proposed are needed to adequately address fatalities due to entrapment of children's necks in the end structures of bunk beds. The Commission voted 2-1 to propose these additional requirements. 64 FR 37051 (July 9, 1999).

B. Incident Data

Deaths

From January 1990 through August 9, 1999, CPSC received reports of 91 bunk-bed-related deaths of children under age 15 (see Table 1 below).

TABLE 1.—FATAL BUNK BED INCIDENTS REPORTED TO CPSC, BY YEAR AND HAZARD PATTERN
[January 1990 to August 9, 1999]

Year	Total ¹	En-trap.	Hang-ing	Falls
1990	7	5	2	.....
1991	15	10	2	3
1992	4	3	1	.....
1993	19	10	7	2
1994	10	6	3	1
1995	12	5	5	2
1996	12	11	1	.....
1997 ²	8	6	2	.....
1998 ²	3	1	1	1
1999 ²	1	.....	1	.....
Total ...	91	57	25	9

Source: CPSC data files, January 1990-August 9, 1999.

¹ These deaths are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they provide a minimum number of deaths occurring during this time period and illustrate the circumstances involved in some bunk-bed-related fatalities.

² The Death Certificate files for 1997 through August 9, 1999, are not complete.

Of the 91 fatalities, 57 resulted from entrapment. An additional 25 children died when they inadvertently were hung from the bed by such items as belts, ropes, clothing, and bedding, and 9 children died in falls from bunk beds.

As shown in Table 2, over 96% (55 of 57) of those who died in entrapment incidents were age 3 and younger, and

¹ The Commission voted 2-1 to issue this rule. Chairman Ann Brown and Commissioner Thomas H. Moore voted to issue the rule. Commissioner Mary Sheila Gall voted against. Statements of the Commissioners concerning this vote are available from the Office of the Secretary.

all but one were younger than 5. In contrast, about 76% (19 of 24) of those who died in hanging incidents were age 6 and older. Fall deaths were split among children 4 years of age and younger and children 9 and older.

TABLE 2.—FATAL BUNK BED INCIDENTS REPORTED TO CPSC, BY VICTIM AGE AND HAZARD PATTERN [January 1990–August 9, 1999]

Age (years)	Total	En-trap.	Hang-ing	Falls
<1	18	16	1	1
1	20	19	1	.....
2	16	13	2	1
3	8	7	.....	1
4	4	1	1	2
5	1	.....	1	.....
6	3	.....	3	.....
7	3	1 ¹	2	.....
8	2	.....	2	.....
9	3	.....	2	1
10+	13	.....	10	3
Total ...	91	57	25	9

Source: CPSC data files, January 1990–August 9, 1999.

¹Child was blind and confined to upper bunk by removal of the ladder.

Using statistical methodology (capture-recapture), about 10 bunk-bed-related entrapment deaths are estimated to have occurred in the United States each year since 1990.

Injuries

From hospital emergency room data reported through the National Electronic Injury Surveillance System (NEISS), the Commission estimates that about 34,300 bunk-bed-related injuries to children under the age of 15 were treated in U.S. hospital emergency rooms during 1998. Forty-one percent of the victims were younger than 5 years. A review of the descriptive comments received for each injury revealed that falls from the bed were involved in a majority of the incidents. There were a few reports of limb entrapment incidents, and one incident involved a 2-year-old male who was found hanging from a bunk bed with a sheet wrapped around his neck; he was admitted to the hospital with a head injury.

Entrapment Incidents

The Commission reviewed entrapment-related incidents, which

accounted for the majority of deaths, in further detail to obtain additional information about the circumstances involved. Both fatal and “near-miss” incidents were included. The “near-miss” incidents, usually reported through consumer complaints, were those in which a child became entrapped in the bed, often requiring rescue by the parent or caregiver. In these cases, there were generally no injuries or injuries were minor (contusions/abrasions). However, the Commission examined “near-miss” incidents because they have the potential for death or serious injury.

There were 122 entrapment incidents from January 1990 through August 9, 1999, of which 57 were fatalities and 65 were “near-misses.” Table 3 illustrates the location in the bunk bed where the child was entrapped.

TABLE 3.—LOCATION IN BUNK BED OF FATAL AND “NEAR-MISS” ENTRAPMENT INCIDENTS

Location of entrapment	Type of incident		
	Total	Fatal	Near-Miss
Top Bunk	77	39	38
Guardrail	51	27	24
Bed/Wall	11	9	2
End structure	12	1	11
Add-on rail	1	1	0
Other	1	0	1
Unknown	1	1	0
Bottom Bunk	27	12	15
Guardrail	1	0	1
Bed/Wall	6	6	0
End structure	14	3	11
Add-on rail	2	2	0
Other	4	1	3
Ladder	7	2	5
Unknown Bunk	11	4	7
Guardrail	2	0	2
Bed/Wall	1	1	0
End structure	4	0	4
“Safety rails”	1	1	0
Other	1	0	1
Unknown	2	2	0
Total	122	57	65

Source: CPSC data files, January 1990–August 9, 1999.

Based on a review of the 57 bunk bed entrapment deaths, the Commission concludes that 39 deaths could have been prevented if the beds had conformed to the current ASTM standard and that 42 could have been prevented by the Commission’s bunk

bed rules. Of the three incidents that occurred in bunk beds conforming to the ASTM standard, two involved entrapment in the upper bunk. In these separate incidents, an 18-month-old infant and a child who was almost 5 years old slipped through the space

between the end of the guardrail and the end structure of the bed and became wedged between the bed and a wall. In the third incident, a 22-month-old child became entrapped by the head in an opening. The opening was between the underside of the upper bunk foundation

support and a curved structural member in the bunk bed end structure.

C. The Rule's Requirements

The final rule defines a bunk bed as any bed in which the underside of any foundation is over 30 inches from the floor.

Any bunk bed shall provide at least two upper bunk guardrails, at least one on each side of the bed. One guardrail shall be continuous between each of the bed's end structures. The other guardrail may terminate before reaching the bed's end structures, providing there is no more than 15 inches (380 mm) between either end of the guardrail and the nearest bed end structure. For bunk beds designed to have a ladder attached to one side of the bed, the continuous guardrail shall be on the other side of the bed. Guardrails shall be attached so that they cannot be removed without either intentionally releasing a fastening device or applying forces sequentially in different directions.

There has been some question about how to interpret the requirement that the guardrail shall be "continuous" between the end structures. The Commission will tolerate a gap between the guardrail and end structure of up to 0.22 inches (so as to not cause a finger entrapment hazard for a child). Moreover, the guardrail need not necessarily be fastened to the end structure (as by bolting or welding).

The upper edge of the guardrails shall be no less than 5 inches (130 mm) above the top surface of the mattress when a mattress of the maximum thickness specified by the bed manufacturer's instructions is on the bed. The Commission does not intend for this requirement to prohibit designs where the wall-side guardrail terminates in a quarter-circle bend and attaches to the side rail of the upper bunk foundation.

With no mattress on the bed, there shall be no openings in the structure between the lower edge of the uppermost member of the guardrail and the underside of the upper bunk's foundation that would permit passage of the wedge block (representing a child's torso) shown in Figure 1 of Parts 1213 and 1513.

The upper edge of the upper bunk end structures shall be at least 5 inches (130 mm) above the top surface of the mattress for at least 50 percent of the distance between the two posts at the head and foot of the upper bunk when a mattress and foundation of the maximum thickness specified by the manufacturer's instructions is on the bed.

With no mattress on the bed, there shall be no openings in the end

structures above the foundation of the upper bunk that will permit the free passage of the wedge block shown in Figure 1 of Parts 1213 and 1513.

There shall be no openings in the end structures between the underside of the foundation of the upper bunk and upper side of the foundation of the lower bunk that will permit the free passage of the wedge block shown in Figure 1, unless the openings are also large enough to permit the free passage of a 9-inch (230-mm) diameter rigid sphere (representing a child's head).

In order to protect against head-first entrapment in a bed's end structure, the Commission's staff developed a test procedure using the template shown in Figure 2 of Parts 1213 and 1513. This template and procedure are similar to those that were developed to address neck entrapment hazards in playground equipment structures and that are specified in ASTM F 1487-98, "Standard Specification for Playground Equipment for Public Use." The ASTM standard for bunk beds does not contain a comparable provision.

Any portion of an opening in the bed's end structure below the foundation of the upper bunk that is required to be probed by the wedge-block probe shown in Figure 1 of Parts 1213 and 1513, and that will allow free passage of a 9-inch diameter sphere, must satisfy the new neck entrapment provisions in the rules.

The template of Figure 2 embodies the following principles. First, a child will not be able to insert his or her neck sideways into an opening of less than 1.88 inches. (This dimension represents the neck breadth of 2.5 inches for a 5th percentile 2-year-old child, minus an allowance of 0.62 inches for tissue compression.)

Second, there is a minimal likelihood of entrapment when the boundaries of an opening converge on the neck at an included angle of greater than 75°. See CPSC memorandum from Shelley Waters Deppa to John Preston, "Voluntary Standards for Gates and Enclosures," January 15, 1985. This angle was chosen because it is slightly larger than the angles involved in neck entrapment accidents with baby gates and expandable enclosures.

In addition, in some boundary configurations, a child who slips while his/her head is in the opening will be removed from the opening by the force of gravity. In the final rule, an opening that indicates a neck entrapment potential when tested with the template of Figure 2 is nevertheless allowed if its lower boundary slopes downward at 45° or more for the whole distance from the narrowest part of the opening the neck

can reach to the part of the opening that will freely pass a 9-inch diameter sphere.

The template is used to protect against head-first entrapment as follows. First, all portions of the boundary of the opening are probed with the "A" section of the test template of Figure 2. The template is inserted into the opening, with the plane of the template in the plane of the opening and with the "top" of the template perpendicular to the centerline of the portion of the boundary being probed. (It may be necessary to detach the "B" section of the template to fit the "A" section into the opening.) The "A" section of the template is then moved along the centerline of the portion of the boundary being probed until it is stopped by contact with the boundaries of the opening (see Figure 3 of Parts 1213 and 1513).

If there is simultaneous contact between the boundary of the opening and both sides of the "A" section of the template, the boundary is converging on a potential neck entrapment point at an angle of less than 75°, and further investigation is required. (Contact at an upper corner of the template, as shown in Figure 2, is not considered to be contact with a "side.")

To check further for the potential for neck entrapment, place the neck portion of the "B" section of the template into the opening, with the template's plane perpendicular to both the plane of the opening and the centerline of the opening (see Figure 4 of Parts 1213 and 1513). If the neck portion can completely enter the opening (pass 0.75 inch or more beyond the points where contact with the sides of the "A" section of the template occurred), the opening may present a neck entrapment hazard. Such an opening is not allowed unless the lower boundary of the opening slopes downward at 45° or more for the whole distance from the narrowest part of the opening the neck can reach to the larger (greater than 9-inch) part of the opening.

There shall be a permanent label or marking on each bed stating the name and address (city, state, and zip code) of the manufacturer, distributor, or retailer; the model number; and the month and year of manufacture.

The following warning label shall be permanently attached to the inside of an upper bunk bed end structure in a location that cannot be covered by the bedding, but that may be covered by the placement of a pillow.

⚠ WARNING

To help prevent serious or fatal injuries from entrapment or falls:

- Never allow a child under 6 years on upper bunk
- Use only a mattress that is ___ inches long and ___ inches wide on upper bunk
- Ensure thickness of mattress and foundation combined does not exceed ___ inches and that mattress surface is at least 5 inches below upper edge of guardrails

DO NOT REMOVE THIS LABEL

BILLING CODE 6355-01-C

Instructions shall accompany each bunk bed set, and shall include the following information.

(a) *Size of mattress and foundation.* The length and width of the intended mattress and foundation shall be clearly stated, either numerically or in conventional terms such as twin size, twin extra-long, *etc.* In addition, the maximum thickness of the mattress and foundation required for compliance with § 1213.3(a)(5) and (b)(1) shall be stated.

(b) *Safety warnings.* The instructions shall provide the following safety warnings:

- (1) Do not allow children under 6 years of age to use the upper bunk.
- (2) Use guardrails on both sides of the upper bunk.
- (3) Prohibit horseplay on or under beds.
- (4) Prohibit more than one person on upper bunk.
- (5) Use ladder for entering or leaving upper bunk.

D. The ASTM Standard

The entrapment requirements in the final rules being issued are identical to those in the ASTM standard, with the following exceptions.

1. *Definition of bunkbed:* In the ASTM standard, a bunk bed is defined as a bed in which the underside of the foundation is over 35 inches from the floor, rather than the 30 inches in the final rule. Neither of these definitions requires that there be two separate sleeping surfaces.

2. *Guardrails:* The final rule provides that one guardrail (the wall side) shall be continuous between the bed's end structures. The other guardrail may terminate before reaching the bed's end structures, providing there is no more

than 15 inches between either end of the guardrail and the nearest bed end structure. The current ASTM standard permits both guardrails to end 15 inches from the nearest bed end structure. Compared to the final rule, this permits two areas where a child could become entrapped between the bed and the wall.

3. *Bunk end structures:* (a) The final rule provides that there shall be no openings in the end structures between the underside of the foundation of the upper bunk and the upper side of the foundation of the lower bunk that will permit the free passage of the wedge block shown in Figure 1 (representing a child's torso) unless the openings are also large enough to permit the free passage of a 9-inch diameter sphere (to ensure the head can also pass through). In the ASTM standard, these passage requirements apply only to that portion of the end structure that is between the level of the lower bunk foundation support system and 9.0 inches (230 mm) above the sleeping surface of the maximum thickness mattress and foundation combined as recommended by the manufacturer.

During 1999, there were three meetings of the ASTM subcommittee at which changes to the ASTM standard were voted upon or discussed. The following discussion describes how these potential changes relate to how close the voluntary standard might have ultimately resembled the final rules if they were not now being issued by the Commission.

The ASTM subcommittee approved a motion to define a bunk bed as a bed in which the underside of the foundation is over 30 inches from the floor, as in the mandatory rule. After discussing the meaning of the term "continuous

guardrail," the subcommittee approved a revision that would require one guardrail on the upper bunk to terminate no greater than 1.5 inches from the end structures, as opposed to the proposed requirement that the guardrail be continuous between the end structures. As noted above, the 1.5 inch space approved by the subcommittee would not comply with the final rule's requirement that the wall-side guardrail be continuous between the end structures.

The revision approved by the ASTM subcommittee also clarified that the 15-inch space between the ends of the other upper bunk guardrail must be measured 5 inches above the sleeping surface of the maximum thickness mattress specified. This clarification agrees with the final rule.

In addition, the subcommittee approved a change to the instructions that must accompany a bunk bed to inform consumers that a bunk bed placed adjacent to a wall must have the continuous guardrail on the wall-side of the bed. This requirement agrees with the final rule.

The ASTM subcommittee voted to expand the current entrapment requirements to include the entire end structure between the level of the upper and lower bunk foundation support systems, as provided in the final rule. Further, it did not oppose adding a neck entrapment requirement to the ASTM standard. However, the members present questioned the need for a 75° angle on the test probe, when a 55° angle on a similar probe in the ASTM public playground equipment standard appeared to have been effective in addressing neck entrapment incidents in openings. A working group was established to draft a recommendation

for the subcommittee on whether the probe to be used in the ASTM bunk bed standard should have a 75° angle as in the proposed rule or a 55° angle as in the playground equipment standard. A motion was approved to accept the recommendation of the working group and to forward it, together with the other previously approved revisions, to ASTM for a ballot by the full subcommittee. At the request of ASTM, CPSC staff searched CPSC playground incident data and verified that no neck entrapments were reported in structures conforming to the requirements in the voluntary playground standards.

A September 9, 1999 letter from the ASTM working group was submitted as a comment on the July 9, 1999 NPR. The letter stated that the working group had recommended to the ASTM subcommittee that the neck entrapment requirement to be added to the ASTM standard for bunk beds will specify the probe in the ASTM public playground equipment standard, which uses a 55° angle.

After the ASTM working group's decision to use the 55° playground equipment probe, manufacturers discussed limiting the revision of the requirements for lower bunk end structures in the ASTM standard to metal bunk beds only. Their rationale for such a limitation is that there have been no known neck entrapment incidents in wooden bunk beds and that it is not likely that a wooden bunk bed would be manufactured with openings of a shape that would present neck entrapment. At the present time, the Commission does not know whether the lower bed end structure requirements in the ASTM standard will apply only to metal beds.

The revisions to the voluntary standard that were approved during the meetings of the ASTM bunk bed subcommittee have not been sent for balloting by the entire subcommittee. The Commission does not know when the ballot will be mailed or what new requirements will be approved.

E. Statutory Authorities for This Proceeding

The FHSA authorizes the regulation of unreasonable risks of injury associated with articles intended for use by children that present mechanical (or electrical or thermal) hazards. FHSA § 2(f)(D), 15 U.S.C. 1261(f)(D). The hazards associated with bunk beds that are described above are mechanical. See FHSA § 2(s), 15 U.S.C. 1261(s). The CPSA authorizes the regulation of unreasonable risks of injury associated with "consumer products," which include bunk beds"whether intended

for the use of children or adults. CPSA § 3(a)(1), 15 U.S.C. § 2052(a)(1).

Thus, bunk beds intended for the use of adults can be regulated only under the CPSA, while bunk beds intended for the use of children potentially could be regulated under either the FHSA or the CPSA. The Commission considers a bunk bed to be intended for use by children if it has smaller than twin-size mattresses or incorporates styling or other features especially intended for use by children. The available data do not indicate whether the known deaths and injuries are occurring on beds intended for use by children. Nevertheless, any regulation for bunk beds should include beds intended for children, since there is no reason why such beds, to the extent they exist, do not present the same risks to children as do adults' bunk beds.

Section 30(d) of the CPSA, however, provides that a risk associated with a consumer product that can be reduced to a sufficient extent by action under the FHSA can be regulated under the CPSA only if the Commission, by rule, finds that it is in the public interest to do so. 15 U.S.C. 2079(d). Because the risks of bunk beds can be addressed with the two-pronged approach (*i.e.*, by both statutes), there appears to be no strong reason why it would be in the public interest to regulate bunk beds only under the CPSA. Accordingly, the requirements were proposed, and are issued, as two separate rules, one under the CPSA for "adult" bunk beds and the other under the FHSA for beds intended for use by children.

F. Statutory Findings Relating to the Voluntary Standard

The Commission may not issue a standard under either the CPSA or the FHSA if an industry has adopted and implemented a voluntary standard to address the risk, unless the Commission finds that "(i) compliance with such voluntary * * * standard is not likely to result in the elimination or adequate reduction of such risk of injury; or (ii) it is unlikely that there will be substantial compliance with such voluntary * * * standard." See 9(f)(3)(D) of the CPSA, 15 U.S.C. 2058(f)(3)(D), and 3(i)(2) of the FHSA, 15 U.S.C. 1262(i)(2). The percentage of currently produced bunk beds that conform to the ASTM standard could be as high as 90% or more. This raises the questions of whether the ASTM standard is substantively adequate and, if so, whether it will command "substantial compliance."

The rule goes beyond the provisions of the ASTM voluntary standard. First, it eliminates the voluntary standard's

option to have an opening of up to 15 inches at each end of the wall-side guardrail. Second, the voluntary standard protects against entrapment only within the 9-inch space immediately above the upper surface of the lower bunk's mattress. The mandatory standard extends this area of protection upward to the level of the underside of the upper bunk foundation. Third, the mandatory standard contains protection against neck entrapment that the voluntary standard lacks. Finally, the mandatory rule applies to bunk beds having a foundation over 30 inches from the floor, rather than the 35 inches in the ASTM standard. These provisions, which are in the rule but not in the voluntary standard, address fatalities and, as noted below, have benefits that bear a reasonable relationship to their costs.

Therefore, the Commission finds that compliance with the voluntary standard is unlikely to eliminate or adequately reduce the risk of entrapment injury or death. For this reason, the voluntary standard does not bar issuance of a rule.

Even if the voluntary and mandatory standards were identical, however, there is the issue of whether there will be substantial compliance with the voluntary standard. Neither the CPSA nor the FHSA define "substantial compliance." The March 3, 1999 Notice of Proposed Rulemaking summarized an interpretation of "substantial compliance" that the Office of General Counsel provided to the Commission. 64 Fed. Reg. 10245, 10248-49 (March 3, 1999). The Commission specifically invited public comment on that interpretation from "all persons who would be affected by such an interpretation." *Id.* at 10249. The Commission received more than 20 comments on the interpretation.

Having now considered all the evidence that the staff has presented, the comments from the public, and the legal advice from the Office of General Counsel, the Commission concludes that there is not "substantial compliance" with the ASTM voluntary standard for bunk beds within the meaning of the Consumer Product Safety Act and the Federal Hazardous Substances Act. See, *e.g.*, 15 U.S.C. 2058(f)(3)(D)(ii); 15 U.S.C. 1262(i)(2)(A)(ii). However, the Commission does not adopt a general interpretation of "substantial compliance" focusing on whether the level of compliance with a voluntary standard could be improved under a mandatory standard. Rather, the grounds for the Commission's decision

focus on the specific facts of this rulemaking and are stated below.

The legislative history regarding the meaning of "substantial compliance" indicates that the Commission should consider whether compliance is sufficient to eliminate or adequately reduce the risk of injury in a timely fashion and that, generally, compliance should be measured in terms of the number of complying products, rather than the number of manufacturers who are in compliance. E.g., Senate Report No. 97-102, p. 14 (May 15, 1981); House Report No. 97-158, p. 11 (June 19, 1981); H. Conf. Rep. No. 97-208, 97th Cong., 1st Sess. 871, reprinted in 1981 U.S. Code Cong. & Admin. News 1010, 1233.

Given this Congressional guidance, the Commission believes it appropriate to examine the number of conforming products as the starting point for analysis. However, the Commission does not believe that there is any single percentage of conforming products that can be used in all cases to define "substantial compliance." Instead, the percentage must be viewed in the context of the hazard the product presents. Thus, the Commission must examine what constitutes substantial compliance with a voluntary standard in light of its obligation to safeguard the American consumer.

There are certain factors the agency considers before it initiates regulatory action, such as the severity of the potential injury, whether there is a vulnerable population at risk, and the risk of injury. See 16 CFR 1009.8. These and other factors also appropriately inform the Commission's decision regarding whether a certain level of conformance with a voluntary standard is substantial. In the light of these factors, industry's compliance rate with the voluntary standard for bunk beds is not substantial.

In this case, the Commission deals with the most severe risk—death—to one of the most vulnerable segments of our population—infants and young children. While the risk of death is not high, it exists whenever a young child is in a residence with a nonconforming bunk bed.

Additionally, some products, such as hairdryers without shock protection devices, require some intervening action (dropping the hair dryer into water) to create the hazard. By contrast, deaths in bunk beds occur during the intended use of the product—a child rolling over in bed or climbing in or out of it—without any intervening action.

The Commission must also consider that bunk beds have a very long product life, frequently being passed on to

several families before being discarded. Thus, a number of children may be exposed to a bed during its useful life. Every noncomplying bed that poses an entrapment hazard presents the potential risk of death to any young child in the house. It is a risk that is hard for a parent to protect against, as children find their way onto these beds even if they are not put to sleep in them.

Bunk beds are products that can be made relatively easily by very small companies, or even by a single individual. The Office of Compliance believes smaller entities will always present a compliance problem, because new manufacturers can enter the marketplace relatively easily and need little expertise to make a wooden bunk bed. The evidence seems to support the view that there will always be an irreducible number of new, smaller bunk bed manufacturers who will not follow the voluntary standard.

What constitutes substantial compliance is also a function of what point in time the issue is examined. In 1989, the Commission denied a petition for a mandatory bunk bed rule. At that time, industry was predicting that by April of 1989, 90% of all beds being manufactured would comply with the voluntary guidelines. But that was in the context of years of steadily increasing conformance and the hope that conformance would continue to grow and that deaths and near-misses would begin to decline. But the conformance level never grew beyond the projection for 1989 and deaths and near-misses have not dropped.

Even with the existing compliance rate, the Commission is contemplating the prospect of perhaps 50,000 nonconforming beds a year (or more) entering the marketplace, with many beds remaining in use for perhaps 20 years or longer. Under these circumstances, a 10% rate of noncompliance is too high.

It is now clear that the bunk bed voluntary standard has not achieved an adequate reduction of the unreasonable risk of death to infants and children in a timely fashion, and it is unlikely to do so. Accordingly, the Commission finds that substantial compliance with the voluntary standard for bunk beds is unlikely.

Products that present some or all of the following factors might not be held to as strict a substantial compliance analysis. Those which:

- Rarely or never cause death;
- Cause only less severe injuries;
- Do not cause deaths or injuries principally to a vulnerable segment of the population;

- Are not intended for children and which have no special attraction for children;
- Have a relatively short life span;
- Are made by a few stable manufacturers or which can only be made by specialized manufacturers needing a significant manufacturing investment to produce the product;
- Are covered by a voluntary standard which continues to capture an increasing amount of noncomplying products; or
- Require some additional intervening action to be hazardous.

And, in analyzing some other product, there could be other factors that would have to be taken into consideration in determining what level of compliance is adequate to protect the public. The tolerance for nonconformance levels has to bear some relationship to the magnitude and manageability of the hazard addressed.

The Commission emphasizes that its decision is not based on the argument that a mandatory rule provides more powerful enforcement tools. If this were sufficient rationale, mandatory rules could always displace voluntary standards, and this clearly was not Congress's intent. But, with a mandatory standard, the necessity of complying with a mandatory federal regulation will be understandable to small manufacturers. State and local governments will have no doubt about their ability to help us in our efforts to locate these manufacturers.

G. Response to Comments

The Commission received 21 written comments in response to the NPR published in the **Federal Register** on March 3, 1999. In addition, six people gave oral testimony in a public hearing held on May 6, 1999. Also, five comments were received in response to the revised entrapment requirements published in the July 9, 1999, **Federal Register**. The Commission's responses to these comments are given below:

1. Comments on the March 3, 1999, NPR

a. *Favoring a mandatory rule:* Seven commenters responding in writing to the March 3, 1999, NPR, and three persons at the May 6, 1999, public hearing, favored a mandatory rule addressing entrapment in bunk beds. Their reasons were varied and included:

- Reports of deaths show there is an unreasonable risk;
- A mandatory standard will improve compliance;
- The benefits show a reasonable relationship to costs;

- A mandatory rule permits the Commission to seek penalties from violators;

- There is increased awareness of mandatory standards; and

- A mandatory standard removes the cost advantage of producing nonconforming beds.

b. *Reference the ASTM standard:* Two comments on the NPR neither opposed nor favored a mandatory rule. The President of ASTM and the chairman of the ASTM F15.30 subcommittee for bunk beds requested that, if the Commission elects to proceed with a mandatory standard, it should reference the ASTM F1427 voluntary standard. At the present time, there are some significant differences in the entrapment requirements in the ASTM standard and those in the mandatory rule. Although the ASTM subcommittee for bunk beds has agreed to make certain revisions to the voluntary standard, these revisions would not make the entrapment requirements in the ASTM standard identical to those in the rule (see additional discussion below in the response to comments on the July 9, 1999 NPR). Further, the Commission does not know that these revisions will be approved by the formal ASTM ballot process. Therefore, the mandatory rule does not reference the ASTM standard, but instead contains specific requirements addressing entrapment.

c. *Substantial compliance:* As noted, where there is a voluntary standard in place, both the CPSA and the FHSA prohibit the Commission from issuing a mandatory standard unless the Commission finds either that the voluntary standard is not likely to eliminate or adequately reduce the risk or that it is unlikely that there will be "substantial compliance" with the voluntary standard.

For the reasons stated in Section F of this notice, the Commission has found both that the voluntary standard will not adequately reduce the risk of injury from bunk beds and that it is unlikely that there will be substantial compliance with the voluntary standard. Therefore, the voluntary standard is not a bar to issuance of a rule.

d. *OMB Circular No. A-119:* One commenter noted that OMB Circular No. A-119 directs agencies to use voluntary standards in lieu of government-unique standards except where they are inconsistent with law or otherwise impractical. However, Circular No. A-119 states that it should not "be construed to commit any agency to the use of a voluntary standard which * * * is, in its opinion, inadequate * * * or is otherwise inappropriate."

The Commission determines that, in this case, reliance on the voluntary standard is "inappropriate" for the reasons stated in Section H of this notice. Thus, Circular No. A-119 does not prevent issuance of a final rule.

e. *Entrapment incidents:* A bunk bed manufacturer claimed that the extra cost and major design changes required to comply with the proposed rule's provisions for a continuous guardrail do not reduce or eliminate the potential hazards. The manufacturer also claimed that there were no incidents of entrapment between a bunk bed and a wall prior to the inception of the 1996 ASTM standard.

However, CPSC is aware of 9 fatalities resulting from entrapment between a top bunk and a wall from 1990 through August 9, 1999. Two of these fatalities occurred in beds conforming to the ASTM standard's requirement for a wall-side guardrail that permits gaps up to 15 inches in width between each end of the guardrail and the bed's end structures. One of these deaths occurred in 1994 and the other in 1996. In both, the victims slipped through the unprotected area between the end of the guardrail and bed end structure. The requirement in the rule for a continuous wall-side guardrail will prevent future incidents of this type.

f. *Hazards in other types of beds:* It was noted by one commenter that other types of beds, such as small single beds and trundle beds, could have the same entrapment hazards as bunk beds if they are used by preschool age children. The commenter, therefore, suggested that any bed intended for preschool age children, and adult beds (since it is predictable that young children will be placed in these beds), should be subject to a mandatory standard.

The Commission did not extend the scope of the standard to cover beds other than bunk beds, because this would involve different considerations of risk, cost, and benefits, and is outside the scope of the present proceeding.

This commenter also recommended that both adult and children's bunk beds should be covered by a single standard, and that the standard should be issued under the CPSA.

As explained in the proposal and in Section E of this notice, the CPSA provides that a risk that can be adequately regulated under the FHSA can be regulated under the CPSA only if the Commission determines, by rule, that regulating the risk under the CPSA is in the public interest. Bunk beds intended for use by children, but not other bunk beds, could adequately be regulated under the FHSA, and the Commission did not find reasons why it

would be in the public interest to regulate the risk from children's bunk beds under the CPSA. Accordingly, the Commission proposed to regulate bunk beds intended for use by children under the FHSA and to regulate other (adult) bunk beds under the CPSA. Although this does not comply with the commenter's recommendation that both categories of bunk beds be regulated under the CPSA, it does comply with the recommendation that the standard's requirements apply to both adults' and children's beds.

g. *Bunk beds for institutional use:* Two comments addressed the issue of whether the rule should apply to bunk beds sold for institutional use, such as school or college dormitories, prisons, and military facilities. One comment, from a trade association representing a number of major producers of bunk beds, states that to include institutional beds in the scope of the rule would be a departure from past CPSC practice. The association asserts that the regulation of public accommodations has traditionally been accomplished through state and municipal building codes. The other comment, from a manufacturer of college dormitory furniture, strongly objects to a regulation that is unsupported by any data to show that there is a high risk for adults or college students. Institutional bunk beds are generally not provided with guardrails, and the manufacturer claims that to add such rails, and comply with other provisions in the proposed rule, would add \$225 to the cost of each of his beds and be of no benefit to an adult user.

Although the Commission cannot confirm the commenter's cost estimate, it agrees that the cost of compliance with the rule would be substantially higher for institutional bunk beds than for residential beds, in part because institutional beds typically do not have any guardrails (since they are intended for teenagers or adults). Furthermore, of the two known fatalities of children that occurred in beds that were originally sold for institutional use, one was an entrapment between the lower bunk mattress and a wall, a scenario not addressed by the rule. The other incident was an entrapment in a gap between the end structure and a mattress that was too short to fit properly on the lower bunk. This incident would be addressed by a label and the instructions for proper mattress size if institutional beds were included in the scope of the rule.

According to information supplied by industry, there are about 200,000 bunk beds sold for the institutional market each year for use by colleges and

boarding schools, the military, mental health facilities, and correctional facilities. The expected useful life of these institutional products is estimated by industry at 7 to 10 years. Therefore, there may be about 1.7 million institutional beds in use. Manufacturers projected that the cost of compliance for institutional bunk beds would be considerably higher than that of residential bunk beds, due to the addition of two guard rails (rather than one for residential) and the heavier-duty materials used in institutional bunk beds. For comparison purposes, if the only significant cost was the addition of two guardrails (equivalent to rails used in residential beds), the cost of compliance for institutional bunk beds would be twice that of residential units, or \$30 to \$80 per bed.

Given that one death would have been addressed during the last 9.5 years, and that an average of about 1.7 million institutional bunk beds may have been in use during those years, the risk addressed by inclusion of institutional beds in the mandatory standard would be about 0.06 deaths per million beds in use per year ((1 death/9.5 years)/1.7 million beds). Assuming a societal cost of \$5 million per death, the annual societal value of averting this risk is about \$0.30 per bed per year. If we assume a useful life of 10 years, and a discount rate of 3%, the estimated present value of averting this risk would be about \$2.55 per bed over its entire useful life. Thus, based on available information, the benefits of the rule, if applied to institutional bunk beds, would likely be substantially less than the costs. Because of this, and because the likelihood that consumers will purchase institutional beds in the future is not known, the Commission decided not to include institutional bunk beds within the scope of the rule. For the purposes of this rule, facilities intended for use by children under age 6 are not considered to be institutions.

h. Effective date: The Commission proposed an effective date of 180 days (6 months) after the final rule is published. A trade association representing a number of major bunk bed producers commented that there should be an 18-month lead time before the rule becomes effective; the association reiterated this in its comments on the July 9, 1999, NPR. A time line showing the tasks needed to comply with the proposed rule was included in the association's comments. The trade association stated that between 5 and 10 months of time were needed to allow manufacturers, distributors, and retailers to sell their inventories.

An allowance of lead time to deplete inventory is not necessary, because the rule will apply only to bunk beds manufactured or imported after the rule's effective date. Deletion of the time allotted for inventory depletion from the trade association's time line would result in an effective date of 8 to 13 months after publication.

The CPSA provides that an effective date shall not exceed 180 days unless the Commission finds that a longer period is in the public interest. Although the schedule provided by the association might be reasonable for a high-volume manufacturer with numerous models affected by the rule, the Commission considers the schedule to be unnecessarily long for the minor changes imposed by the rule on the small manufacturers likely to be affected. Thus, the Commission cannot conclude it is in the public interest to extend the effective date past the proposed 180-day period. The Commission concludes that the 180-day period between publication of the final rule and its effective date is reasonable and adequate to allow manufacturers time to make any necessary product changes.

2. Comments on the July 9, 1999, NPR

a. Support for the rule: One commenter, who had previously submitted a comment supporting the rule in the March 3, 1999, NPR, also supports the revised rule on the grounds that "these requirements are necessary to address fatalities due to entrapment of children's necks in end structures of bunk beds." The commenter also believes "that the Commission should not defer to the ASTM voluntary standard because of widespread lack of compliance and because the current voluntary standard is inadequate." As previously stated, the Commission is not relying on the voluntary standard.

b. Neck entrapment probe: Two comments from bunk bed manufacturers that are members of the ASTM F15.30 subcommittee addressed the angle incorporated into the probe in the revised proposed rule. One of the comments, submitted on behalf of the entire subcommittee, stated that the lower bunk end-structure requirements in the ASTM standard would be revised in accordance with the requirements in the proposed rule (§§ 1213.3(b)(3) & (4), 1213.4, 1513.3(b)(3) & (4), and 1513.4), except that the sides of the probe (see Figure 2) would have a 55° angle relative to the centerline of the probe instead of the 75° angle of the probe in the revised proposed rule. The comment from the other manufacturer, a member of the ASTM bunk bed subcommittee,

also addressed the angle on the end-structure probe and stated that, while he could accept a probe with either angle, it was his opinion that the 55° angle should be adopted. Both of these comments supported a 55° angle based on its apparent success in preventing neck entrapment incidents in playground equipment.

Another comment, from a trade association representing major manufacturers of bunk beds, reiterated the association's comment on the March 3, 1999 NPR that it was not opposed to a mandatory rule for bunk beds, and supported a provision to address neck entrapment in lower bunk end structures. It also takes no position on the appropriate probe for this purpose, but recommends "a probe which eliminates or adequately reduces the risk of neck entrapment."

In drafting the neck entrapment requirements, the CPSC staff initially considered using a probe identical to that in the ASTM F1487 standard for public playground equipment (with a 55° angle). The rationale for the 55° angle stems from a recommendation by a committee, convened in 1976 by the National Recreation and Park Association (NRPA), that developed requirements for a possible CPSC mandatory standard for playground equipment. The angle requirement was "intended to eliminate dangerous angles that could form openings tending to entrap or strangle the user." The rationale for the committee's recommendation stated: "[I]t is best engineering judgement at this point, and takes into consideration the fact that most angles present in current equipment are 60° or greater." Based on this NRPA committee recommendation, the CPSC Handbook for Public Playground Safety, first published in 1981, also addresses neck entrapment in angles on public playground equipment by recommending that angles be greater than 55°.

The Commission decided that the angle on the neck entrapment probe in the bunk bed standard should be 75°, instead of 55°, for a number of reasons. First, in 1985, following a number of deaths resulting from neck entrapment in accordion-style baby gates and enclosures, the staff worked with industry to draft requirements for a voluntary standard for these products. The staff developed a probe that had an angle of 75° at its base, because an 11-month-old child had become fatally entrapped in a diamond-shaped opening in a baby gate having a 71° angle at its base. The probe was designed to protect children two years of age and younger. It was accepted by the ASTM gate and

enclosure subcommittee and eliminated V-shaped openings with angles less than 75°.

Second, the lack of injury data involving public playground equipment having angles greater than 55° does not convince the Commission that a 55° probe would adequately protect children. The potential for children to become entrapped in an angle between 55° and 75° depends on the type of equipment. The pieces of public playground equipment most likely to have angles between 55 and 75° that could cause neck entrapment are dome climbers and handrails on ladders. Public playground equipment is generally intended for children from 2 through 12 years of age. Dome climbers are not appropriate for children under 5 years of age. Children 5 years of age and older who use dome climbers are more likely to be able to call out for assistance or pull themselves up and out if they become entrapped. As for ladder handrails, the angles that potentially could be an entrapment hazard are generally located at the bottom of the ladder below the neck level of even small children.

Finally, children under 2 years of age are almost always supervised when playing in public playgrounds, and adult assistance would be readily available if needed. This is not the case with bunk beds, where children are left to sleep unattended.

For the above reasons, the Commission concludes that a 75° angle on the neck entrapment probe is necessary to adequately address the risk of entrapment in bunk bed end structures to protect children under 2 years of age.

H. The Need for a Mandatory Standard

As noted in Section F of this notice, a mandatory standard is needed to provide requirements that are not now in the voluntary standard. In deciding to issue this rule, the Commission also considered carefully the particular characteristics of the bunk bed industry. This industry is highly diverse and fragmented, with differing levels of sophistication relating to product safety. Firms can easily enter and leave the bunk bed manufacturing business. This fragmentation and diversity contributes to difficulties in achieving more complete compliance with the voluntary standard.

Because it is difficult to identify all firms in the industry, it is difficult for voluntary standards organizations and trade associations to conduct outreach and education efforts regarding the voluntary standard. By contrast, in industries with a smaller number of

firms (and particularly large firms), it is easier to find the firms and educate them about the existence and importance of voluntary standards. Mandatory standards—codified in the accessible Code of Federal Regulations—are easier to locate, and their significance is more obvious.

These generalizations about the industry are supported by the staff's enforcement experience. The CPSC's Office of Compliance (EXC) is aware of 167 firms who currently either manufacture or import bunk beds. Between November 1994 and October 1997, CPSC staff participated in eight recalls of bunk beds that did not comply with the voluntary standard. The recalls involved 41 manufacturers and importers, and affected approximately 531,000 bunk beds. In early 1998, CPSC Compliance staff conducted limited retail surveillance of bunk beds for compliance with the voluntary standard. Twenty-three firms had at least one model of bunk bed that did not conform, and six of these firms were repeat violators. This surveillance resulted in five recalls, involving approximately 37,000 beds.

Later in 1998, a consumer complaint and a report under Section 15 of the CPSA sparked investigations that resulted in recalls of 58,000 bunk beds and 5,400 bunk bed kits. To date, the total number of bunk beds and kits recalled since 1994 has risen to more than 630,000, involving 48 firms.

Since 1994, at the completion of each round of surveillance and follow-up action, CPSC staff believed that the known bunk bed manufacturers complied with the voluntary standard. This is the case today. Yet, each time, the staff later discovered more manufacturers, and some of their beds had to be recalled because they presented a risk of entrapment. The Commission believes that, in the absence of a mandatory rule, this pattern would continue.

Some manufacturers contacted by Compliance did not see an urgency to comply with a "voluntary" standard, and they did not recognize the hazards associated with noncompliance. Other manufacturers were not even aware of the standard. As a result, in the absence of a mandatory standard, entrapment hazards would continue to exist on beds in use and for sale.

For the foregoing reasons, the Commission believes that a mandatory bunk bed entrapment standard is needed and has, therefore, decided to issue the mandatory rule.

A mandatory bunk bed entrapment standard will bring the following benefits:

1. A mandatory standard will increase the awareness and sense of urgency of manufacturers in this industry regarding compliance with the entrapment provisions, thereby increasing the degree of conformance to those provisions.

2. A mandatory standard will allow the Commission to seek penalties for violations. Publicizing fines for noncompliance with a mandatory standard will deter other manufacturers from making noncomplying beds.

3. A mandatory standard will allow state and local officials to assist CPSC staff in identifying noncomplying bunk beds and taking action to prevent the sale of these beds.

4. Under a mandatory standard, retailers and distributors will violate the law if they sell noncomplying bunk beds. Retailers and retail associations will then insist that manufacturers and importers provide complying bunk beds.

5. The bunk bed industry is extremely competitive. Manufacturers who now conform to the ASTM standard have expressed concern about those firms that do not. Nonconforming beds can undercut the cost of conforming beds. A mandatory standard will take away any competitive cost advantage for unsafe beds.

6. A mandatory standard will help prevent noncomplying beds made by foreign manufacturers from entering the United States. CPSC could use the resources of the U.S. Customs Service to assist in stopping hazardous beds at the docks.

I. Other Statutory Requirements and Findings

The Commission is issuing the requirements for bunk beds not intended for use by children as a consumer product safety standard under the CPSA. This requires a finding that the requirements are reasonably necessary to eliminate or adequately reduce an unreasonable risk of injury presented by bunk beds. This finding is made in the appendix to Part 1213.

Section 9(e) of the CPSA requires that, in promulgating a consumer product safety rule, "the Commission shall also consider and take into account the special needs of elderly and handicapped persons to determine the extent to which such persons may be adversely affected by such rule." 15 U.S.C. 2058(e).

The requirements for end-structure openings and, except as noted below, for a continuous guardrail on the wall side of bunk beds do not entail any inconvenience for the user. The requirement that guardrails cannot be

removed without either intentionally releasing a fastening device or applying forces sequentially in different directions also is expected to not have a significant adverse effect on the elderly or handicapped. First, the voluntary standard has required this safety feature for many years, and many currently manufactured bunk beds already have this feature. Second, handicapped or elderly persons rarely use the top bunk. Third, once installed, guardrails are likely to be left in place. Finally, the actions needed to use guardrails with these features would present little or no additional difficulty for elderly or handicapped persons who can remove guardrails without these features. Therefore, after considering the effects of the rule on elderly and handicapped persons, the Commission concludes that the life saving benefits of the rule clearly warrant whatever small adverse effect it may cause on the use of bunk beds by the elderly or handicapped, if any.

The regulation for bunk beds intended for the use of children requires a determination under FHSA Section 3(a)(1) that bunk beds that do not comply with the rule present mechanical hazards, as provided in FHSA Section 3(a)(1), and are thus hazardous substances. See FHSA Sections 2(f)(1)(D) and 2(s). Under the FHSA, a product that is a hazardous substance and intended for use by children is banned. FHSA Section 2(q)(1). This finding is made in the appendix to Part 1513.

To issue a final rule under either the CPSA or the FHSA, the Commission must publish the text of the final rule and a final regulatory analysis that includes the elements stated in 3(i)(1) of the FHSA or section 9(f)(2) of the CPSA. 15 U.S.C. 1262(i)(1), 2058(f)(2). The required final regulatory analysis is in Section J of this notice.

Before issuing a final regulation under either the CPSA or the FHSA, the Commission must make other statutory findings. These concern voluntary standards, the relationship of the costs and benefits of the rule, and the burden imposed by the regulation. CPSA § 9(f)(3), 15 U.S.C. 2058(f)(3); FHSA § 3(i)(2), 15 U.S.C. 1262(i)(2). These findings are made in the appendices to Parts 1213 and 1513, respectively.

J. Final Regulatory Analysis

Introduction: The rules issued in this notice are under the authority of both the CPSA and the FHSA. Both statutes require that the Commission publish a final regulatory analysis of the rule. The Commission's final regulatory analysis is published below. (Since the technical

requirements of the rule under the CPSA and the rule under the FHSA are identical, this analysis will refer to "the rule.")

Product and market information: The retail prices of bunk beds range from about \$100 to over \$700; manufacturers estimate the average retail price to be about \$300. Some models now have a lower double bed with a twin upper bunk.

The American Furniture Manufacturers Association (AFMA) represents manufacturers of bunk beds. According to AFMA, 40 firms, either AFMA members or members of the existing ASTM bunk bed subcommittee, account for 75–80% of total known annual sales of bunk beds. Through Compliance staff activities, the Commission is now aware of 167 manufacturers of bunk beds. The share of the market accounted for by the 127 manufacturers or distributors who are not AFMA members or members of the ASTM subcommittee is not known, but is believed to account for a majority of the remaining 20–25% of annual sales.

Bunk beds are a category of bedroom furniture, and every manufacturer of bedroom furniture is a potential producer of bunk beds. Further, because of their straightforward design, other types of businesses (and individuals) can also produce these products. Thus, it is likely that there are other unidentified manufacturers, each producing small numbers of bunk beds.

Industry sources estimate that about 500,000 bunk beds are sold annually for household use, and that the expected useful life of these products is 13–17 years. Based on this information, the CPSC's Product Population Model (a computer-generated statistical program) estimates that there may be about 8 million bunk beds in household use.

AFMA sources indicate that imports of bunk beds by its members appear to be increasing. Industry sources indicate that most, if not all, metal bunk beds sold are imported. Metal bunk beds are estimated to account for about 20% of the sales of bunk beds.

Conformance with the existing voluntary standard: There is an existing voluntary standard for bunk beds, ASTM F1427. There are no known government or industry data describing the extent of conformance to this standard. However, based on its knowledge of industry practices, the Commission's Engineering Sciences staff (ES) estimated that roughly 50% of production from 1979 to 1986 conformed to the standard's upper bunk entrapment requirements. Staff estimates that, as the industry publicized the guidelines and CPSC

staff became involved in the standards process, conformance increased to roughly 75% of production during the period 1986 to 1992. The conformance was estimated to have increased further after 1992, when ASTM published its bunk bed standard and the staff (EXC) became active in monitoring for conformance to the standard. Staff estimates that up to 90% or more of production since 1992 conforms to the ASTM standard.

EXC reported that the bunk beds produced by the 40 firms that are either members of AFMA or the ASTM subcommittee all conform to the existing voluntary standard. EXC staff also examined the product lines of the remaining 127 identified firms, and believes that, after a number of recall activities, all of the beds produced by these firms were in conformance with the standard.

Costs and Benefits

Potential Costs. The costs associated with the mandatory rule include the cost of adapting to the provisions of the rule for any firms not now meeting those requirements. The cost factors affected by these requirements are any increases in the cost of materials, and any redesign costs necessary to comply with the mandatory rule.

Four manufacturers that previously had modified their production stated that the additional materials needed to address entrapment were nominal compared to overall materials costs in bunk bed production. They also stated that any redesign costs would not be significant on a per-unit basis. The most significant cost was the addition of a continuous guardrail to the top bunk, which might add \$15 to \$40 to the average retail price of bunk beds (or 5% to 13% of the average retail price). This cost will apply only to bunk beds in current production that do not now meet the voluntary standard.

There are also costs to some of the firms that now conform to the voluntary standard requirement for a wall-side guardrail, because the current voluntary standard allows for a 15-inch gap at either or both ends of this guardrail. A spokesman for a major independent bunk bed testing lab estimated that bunk bed models conforming to the voluntary standard are split about equally between those having a continuous wall-side rail (about 72 inches in length) and those having a 15-inch gap on one or both ends of the wall-side rail.

Thus, about 50% of all models that meet the current voluntary standard may require some change in design, as well as additional materials, to meet the requirements in the mandatory

standard. The incremental cost of closing the gap (or gaps) in the wall-side top rail is unknown. However, because a continuous rail is merely an extension of the existing rail already in place, the increase in the retail price is probably less than proportional to the increase in length. Thus, if a continuous rail adds \$15 to \$40 to the price of a bunk bed, closing the gap on the wall-side rail may cost consumers no more than about \$5 to \$10.

For a small number of firms, the rule may also result in costs associated with modifications of some bottom bunk end structures. Such modifications to openings may be required to prevent the free passage of a wedge block (simulating a child's torso) if they do not allow the free passage of a sphere (simulating a child's head). The requirement also addresses the shape of openings that could admit a child's neck, and entrap the head in the end structure. The Commission is aware of few current designs that will be affected by this latter requirement. However, if these one-time redesign costs are amortized over the entire production runs for these firms, the per-unit costs are expected to be small.

Potential benefits. The expected societal costs of bunk bed entrapment deaths represent the potential benefits of preventing these deaths. Epidemiology staff reported that there were 57 entrapment deaths associated with bunk beds from 1990 through August 9, 1999. Based on a review of the circumstances of the reports, staff concluded that the voluntary standard would have addressed 37 of the 39 top bunk entrapment deaths and 2 of the 3 bottom bunk end structure entrapment deaths. Altogether, the Commission concludes that the voluntary standard would have addressed 68% (39/57) of the reported fatalities due to entrapment in both the top and bottom bunk locations. Additionally, conformance to the final rule (as opposed to the voluntary standard) will address another 3 of the 57 (about 5%) entrapment deaths, including the 2 top-bunk deaths that would not have been addressed by the voluntary standard, and 1 bottom bunk end-structure death.

The Commission projects that about 10 bunk bed entrapment fatalities have occurred annually since 1990. Thus, for the segment of bunk beds that do not conform to the voluntary standard, the rule will address about 7 deaths per year. For the segment of bunk beds that conform to the requirements of the voluntary standard but not the rule, the rule will address an additional death every other year, or about 0.5 deaths per year.

To determine the expected benefits of the rule, it is necessary to estimate the risk of entrapment death associated with bunk beds not conforming to the requirements of the mandatory rule. In this case, the risk computation requires information on the number of bunk beds that did not conform to the voluntary standard and on the number of bunk beds that conformed to the voluntary standard but not the mandatory rule.

Since an estimated 1.2 to 2.4 million bunk beds in use since 1990 did not conform to the voluntary standard, the risk of entrapment addressed by the rule for this group of beds ranges from about 2.9 to 5.8 deaths per million nonconforming beds (7 deaths per 2.4 million beds to 7 deaths per 1.2 million beds). At an assumed societal cost of \$5 million per death, a useful life of about 15 years for a bunk bed, and a discount rate of 3%, the estimated present value of averting entrapment fatalities on beds that did not conform to the voluntary standard ranges from about \$175 to \$350 per noncomplying bed.

The rule will also address another 0.5 entrapment deaths annually that would not have been addressed by the voluntary standard. Assuming that about one-half of the 5.6 to 6.8 million bunk beds would have conformed to the voluntary standard but not the mandatory rule, the risk of entrapment for these beds would have ranged from about 0.15 to 0.18 deaths per million beds (0.5 deaths per 3.4 million beds to 0.5 deaths per 2.8 million beds). Using the assumptions stated above, the estimated present value of averting entrapment fatalities not addressed by the voluntary standard ranges from \$9 to \$11 per noncomplying bed.

Comparison of costs and benefits. The above analysis evaluated the costs and benefits of the rule for two market segments: bunk beds that do not conform to the voluntary standard, and bunk beds that conform to the requirements of the voluntary standard but not to the requirements of the mandatory rule. For the segment of bunk beds that does not conform to the voluntary standard, the expected benefits of the rule (about \$175 to \$350 per bed) are substantially greater than the expected costs of the rule (about \$15 to \$40 per bed). Thus, if the standard prevents all of the deaths addressed on bunk beds not conforming to the voluntary standard, the expected net benefits per bed sold will range from a low of about \$135 (\$175 - \$40) to about \$335 (\$350 - \$40), and will average about \$235 per bed. The effectiveness of the standard in preventing the injuries and deaths it addresses is expected to be very high.

For the second segment, those beds that meet the requirements of the voluntary standard but not those of the rule, the expected benefits range from about \$9 to \$11 per bed and the costs range from about \$5 to \$10.

Institutional bunk beds. The Commission also considered applying the rule to bunk beds produced for the institutional market (such as for colleges, the military, etc.). As described in Section G of this notice, the Commission excluded institutional bunk beds from the rule.

K. Final Regulatory Flexibility Act Certification

The Commission is required by the Regulatory Flexibility Act of 1980 (RFA) to address and give particular consideration to the economic effects of the rule on small entities.

The precise number of firms manufacturing bunk beds is not known. Commission staff has identified 167 firms that have produced bunk beds: these were identified through the trade association, national and regional trade shows, industry contacts, the Internet, and retail inspections. Small Business Administration guidelines classify firms in the furniture industry as small if they have less than 500 employees, are independently owned, and are not dominant in the field; thus, most of the identified firms would be classified as small businesses. It is likely that there are additional unidentified firms that produce relatively small numbers of bunk beds. These remaining producers are also likely to be small businesses.

Even though there is a substantial number of small firms, the Commission does not expect that there will be a significant effect on these firms. As noted earlier, after the extensive recall activities conducted by the Commission's staff, the 167 firms identified by the staff apparently conform to the existing voluntary standard, and will require only slight modifications to comply with the mandatory rule. For firms not conforming to the voluntary standard, the requirements are expected to result in cost increases that are small and likely to be passed on to consumers.

The mandatory rule will not require third-party testing, and it is anticipated that firms themselves will do the testing required to certify that their products comply with the mandatory standard.

There are no reporting or recordkeeping requirements under the rule. There are no Federal rules that the rule will duplicate, or with which it will overlap or conflict.

Accordingly, the Commission certifies that the rule will not have a significant

economic impact on a substantial number of small entities.

L. Environmental Assessment

The rule will not cause manufacturers to dispose of existing construction materials or packaging. Sale of inventories of finished noncomplying products (including those at retail) will not be prohibited, since the rule will apply only to units produced or imported after the effective date.

The rule is not expected to have a significant effect on the materials used in the production and packaging of subject bunk beds, or in the number of units discarded after the rule.

Therefore, no significant environmental effects are expected to be caused by the rule for bunk beds.

M. Executive Orders

Executive Order No. 12,988 requires agencies to state the preemptive effect, if any, to be given the regulation. The preemptive effects of these rules are established by Section 26 of the CPSA, 15 U.S.C. 2075, and Section 18 of the FHSA. Section 26(a) of the CPSA states:

(a) Whenever a consumer product safety standard under [the CPSA] applies to a risk of injury associated with a consumer product, no State or political subdivision of a State shall have any authority either to establish or continue in effect any provision of a safety standard or regulation which prescribed any requirements as to the performance, composition, contents, design, finish, construction, packaging, or labeling of such products which are designed to deal with the same risk of injury associated with such consumer product, unless such requirements are identical to the requirements of the Federal standard.

Subsection (b) of 15 U.S.C. 2075 provides a circumstance under which subsection (a) does not prevent the Federal Government or the government of any State or political subdivision of a State from establishing or continuing in effect a safety standard applicable to a consumer product for its own [governmental] use, and which is not identical to the consumer product safety standard applicable to the product under the CPSA. This occurs if the Federal, State, or political subdivision requirement provides a higher degree of protection from such risk of injury than the consumer product safety standard.

Subsection (c) of 15 U.S.C. 2075 authorizes a State or a political subdivision of a State to request an exemption from the preemptive effect of a consumer product safety standard. The Commission may grant such a request, by rule, where the State or political subdivision standard or regulation (1) provides a significantly higher degree of protection from such

risk of injury than does the consumer product safety standard and (2) does not unduly burden interstate commerce.

Similar preemption provisions are in the FHSA. See FHSA Section 18(b), 15 U.S.C. 1261 note.

This rule has been evaluated in light of the principles stated in Executive Order No. 13,132 concerning federalism, even though that Order does not apply to independent regulatory agencies, such as CPSC. The only substantial federalism concern associated with this rule is preemption of non-identical state standards. The Commission is aware of standards in California and Oklahoma that differ from the final rule in minor ways. In fact, the Commission understands that the intent of the California standard was to duplicate the anticipated Federal rule.

By establishing findings the Commission must make to issue these types of rules and expressly providing for preemption of non-identical state standards, Congress clearly intended preemption of state law in these circumstances. Further, the preemption is the minimum required to carry out the purposes of the CPSA and the FHSA. In view of the minor differences between these two state rules and the Federal rule, the Commission concludes that the Federal rule will have no adverse effect on the safety of the citizens of these two states.

Further, to the extent that these state rules differ from each other and from the voluntary standard, manufacturers who would like to provide bunk beds to either of these states and to another state may have to sell different versions of their beds to satisfy the conflicting standards. Thus, these state rules, if not preempted, could have an adverse economic effect on manufacturers and distributors.

List of Subjects in 16 CFR Parts 1213, 1500, and 1513

Bunk beds, Consumer protection, Infants and children, Reporting and recordkeeping requirements.

Effective date. These rules will become effective June 19, 2000.

For the reasons set out in the preamble, the Commission amends Title 16, Chapter II, Subchapters B and C, of the Code of Federal Regulations as set forth below.

1. A new Part 1213 is added to Subchapter B, to read as follows:

PART 1213—SAFETY STANDARD FOR ENTRAPMENT HAZARDS IN BUNK BEDS

Sec.

1213.1 Scope, application, and effective date.

1213.2 Definitions.

1213.3 Requirements.

1213.4 Test methods.

1213.5 Marking and labeling.

1213.6 Instructions.

1213.7 Findings.

Figures 1–4

Appendix to Part 1213—Findings Under the Consumer Product Safety Act

Authority: 15 U.S.C. 2056, 2058.

§ 1213.1 Scope, application, and effective date.

(a) *Scope, basis, and purpose.* This part 1213, a consumer product safety standard, prescribes requirements for bunk beds to reduce or eliminate the risk that children will die or be injured from being trapped between the upper bunk and the wall, in openings below guardrails, or in other structures in the bed.

(b) *Application and effective date.* The standard in this part applies to all bunk beds, except those manufactured only for institutional use, that are manufactured in the United States, or imported, on or after June 19, 2000. (Facilities intended for use by children under age 6 are not considered to be institutions.) Bunk beds intended for use by children are subject to the requirements in 16 CFR 1500.18(a)(18) and 16 CFR part 1513, and not to this part 1213. However, those regulations are substantively identical to the requirements in this part 1213.

§ 1213.2 Definitions.

As used in this part 1213:

Bed. See *Bunk bed*.

Bed end structure means an upright unit at the head and foot of the bed to which the side rails attach.

Bunk bed means a bed in which the underside of any foundation is over 30 inches (760 mm) from the floor.

Foundation means the base or support on which a mattress rests.

Guardrail means a rail or guard on a side of the upper bunk to prevent a sleeping occupant from falling or rolling out.

§ 1213.3 Requirements.

(a) *Guardrails.* (1) Any bunk bed shall provide at least two guardrails, at least one on each side of the bed, for each bed having the underside of its foundation more than 30 inches (760 mm) from the floor.

(2) One guardrail shall be continuous between each of the bed's end

structures. "Continuous" means that any gap between the guardrail and end structure shall not exceed 0.22 inches (5.6 mm) (so as to not cause a finger entrapment hazard for a child).

(3) The other guardrail may terminate before reaching the bed's end structures, providing there is no more than 15 inches (380 mm) between either end of the guardrail and the nearest bed end structures.

(4) For bunk beds designed to have a ladder attached to one side of the bed, the continuous guardrail shall be on the other side of the bed.

(5) Guardrails shall be attached so that they cannot be removed without either intentionally releasing a fastening device or applying forces sequentially in different directions.

(6) The upper edge of the guardrails shall be no less than 5 inches (130 mm) above the top surface of the mattress when a mattress of the maximum thickness specified by the bed manufacturer's instructions is on the bed. This requirement does not prohibit a wall-side guardrail that terminates in a quarter-circle bend and attaches to the side rail of the upper bunk foundation.

(7) With no mattress on the bed, there shall be no openings in the structure between the lower edge of the uppermost member of the guardrail and the underside of the upper bunk's foundation that would permit passage of the wedge block shown in Figure 1 of this part when tested in accordance with the procedure at § 1213.4(a).

(b) *Bed end structures.* (1) The upper edge of the upper bunk end structures shall be at least 5 inches (130 mm) above the top surface of the mattress for at least 50 percent of the distance between the two posts at the head and foot of the upper bunk when a mattress and foundation of the maximum thickness specified by the manufacturer's instructions is on the bed.

(2) With no mattress on the bed, there shall be no openings in the end structures above the foundation of the upper bunk that will permit the free passage of the wedge block shown in Figure 1 when tested in accordance with the procedure at § 1213.4(b).

(3) When tested in accordance with § 1213.4(c), there shall be no openings in the end structures between the underside of the foundation of the

upper bunk and upper side of the foundation of the lower bunk that will permit the free passage of the wedge block shown in Figure 1, unless the openings are also large enough to permit the free passage of a 9-inch (230-mm) diameter rigid sphere.

(4) All portions of the boundary of any opening required by §§ 1213.4(c)(1) and (2) to be probed by the wedge block of Figure 1, and that permits free passage of a 9-inch diameter sphere, must conform to the neck entrapment requirements of § 1213.4(c)(3).

§ 1213.4 Test methods.

(a) *Guardrails* (see § 1213.3(a)(6)). With no mattress on the bed, place the wedge block shown in Figure 1, tapered side first, into each opening in the bed structure below the lower edge of the uppermost member of the guardrail and above the underside of the upper bunk's foundation. Orient the block so that it is most likely to pass through the opening (e.g., the major axis of the block parallel to the major axis of the opening) ("most adverse orientation"). Then gradually apply a 33-lbf (147-N) force in a direction perpendicular to the plane of the large end of the block. Sustain the force for 1 minute.

(b) *Upper bunk end structure* (see § 1213.3(b)(2)). Without a mattress or foundation on the upper bunk, place the wedge block shown in Figure 1 into each opening, tapered side first, and in the most adverse orientation. Determine if the wedge block can pass freely through the opening.

(c) *Lower bunk end structure* (see § 1213.3(b)(3)). (1) Without a mattress or foundation on the lower bunk, place the wedge block shown in Figure 1, tapered side first, into each opening in the lower bunk end structure in the most adverse orientation. Determine whether the wedge block can pass freely through the opening. If the wedge block passes freely through the opening, determine whether a 9-inch (230-mm) diameter rigid sphere can pass freely through the opening.

(2) With the manufacturer's recommended maximum thickness mattress and foundation in place, repeat the test in paragraph (c)(1) of this section.

(3) All portions of the boundary of any opening that is required to be probed by the wedge block of Figure 1

by paragraphs (c)(1) and (c)(2) of this section, and that permits free passage of a 9-inch diameter sphere, must satisfy the requirements of paragraphs (c)(3)(i) and (c)(3)(ii) of this section addressing neck entrapment.

(i) Insert the "A" section of the test template shown in Figure 2 of this part into the portion of the boundary of the opening to be tested, with the plane of the template in the plane of the opening and with the centerline of the top of the template (as shown in Figure 2) aligned parallel to the centerline of the opening, until motion is stopped by contact between the test template and the boundaries of the opening (see Figure 3 of this part). By visual inspection, determine if there is simultaneous contact between the boundary of the opening and both sides of the "A" section of the template. If simultaneous contact occurs, mark the contact points on the boundary of the opening and conduct the additional test described in paragraph (c)(3)(ii) of this section.

(ii) To check the potential for neck entrapment, place the neck portion of the "B" section of the template into the opening, with its plane perpendicular to both the plane of the opening and the centerline of the opening (see Figure 4 of this part). If the neck portion of the "B" section of the template completely enters the opening (passes 0.75 inch or more beyond the points previously contacted by the "A" section of the template), the opening is considered to present a neck entrapment hazard and fails the test, unless its lower boundary slopes downward at 45° or more for the whole distance from the narrowest part of the opening the neck can reach to the part of the opening that will freely pass a 9-inch diameter sphere.

§ 1213.5 Marking and labeling.

(a) There shall be a permanent label or marking on each bed stating the name and address (city, state, and zip code) of the manufacturer, distributor, or retailer; the model number; and the month and year of manufacture.

(b) The following warning label shall be permanently attached to the inside of an upper bunk bed end structure in a location that cannot be covered by the bedding but that may be covered by the placement of a pillow.

BILLING CODE 6355-01-P

**WARNING**

To help prevent serious or fatal injuries from entrapment or falls:

- Never allow a child under 6 years on upper bunk
- Use only a mattress that is ___ inches long and ___ inches wide on upper bunk
- Ensure thickness of mattress and foundation combined does not exceed ___ inches and that mattress surface is at least 5 inches below upper edge of guardrails

DO NOT REMOVE THIS LABEL

BILLING CODE 6355-01-C

§ 1213.6 Instructions.

Instructions shall accompany each bunk bed set, and shall include the following information.

(a) *Size of mattress and foundation.* The length and width of the intended mattress and foundation shall be clearly stated, either numerically or in conventional terms such as twin size, twin extra-long, *etc.* In addition, the maximum thickness of the mattress and foundation required for compliance with § 1213.3(a)(5) and (b)(1) shall be stated.

(b) *Safety warnings.* The instructions shall provide the following safety warnings:

- (1) Do not allow children under 6 years of age to use the upper bunk.
- (2) Use guardrails on both sides of the upper bunk.
- (3) Prohibit horseplay on or under beds.

(4) Prohibit more than one person on upper bunk.

(5) Use ladder for entering or leaving upper bunk.

(6) If the bunk bed will be placed next to a wall, the guardrail that runs the full length of the bed should be placed against the wall to prevent entrapment between the bed and the wall. (This applies only to bunk beds without two full-length guardrails.)

§ 1213.7 Findings.

The Consumer Product Safety Act requires that the Commission, in order to issue a standard, make the following findings and include them in the rule. 15 U.S.C. 2058(f)(3). These findings are contained in the Appendix to this Part 1213.

(a) The rule in this part (including its effective date of June 19, 2000 is reasonably necessary to eliminate or

reduce an unreasonable risk of injury associated with the product.

[These findings are contained in the Appendix to this part 1213.]

(b) Promulgation of the rule is in the public interest.

(c) Where a voluntary standard has been adopted and implemented by the affected industry, that compliance with such voluntary standard is not likely to result in the elimination or adequate reduction of the risk of injury; or it is unlikely that there will be substantial compliance with such voluntary standard.

(d) The benefits expected from the rule bear a reasonable relationship to its costs.

(e) The rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury for which the rule is being promulgated.

BILLING CODE 6355-01-P

Figure 1 to Part 1213—Wedge Block for Tests in § 1213.4(a), (b), and (c)

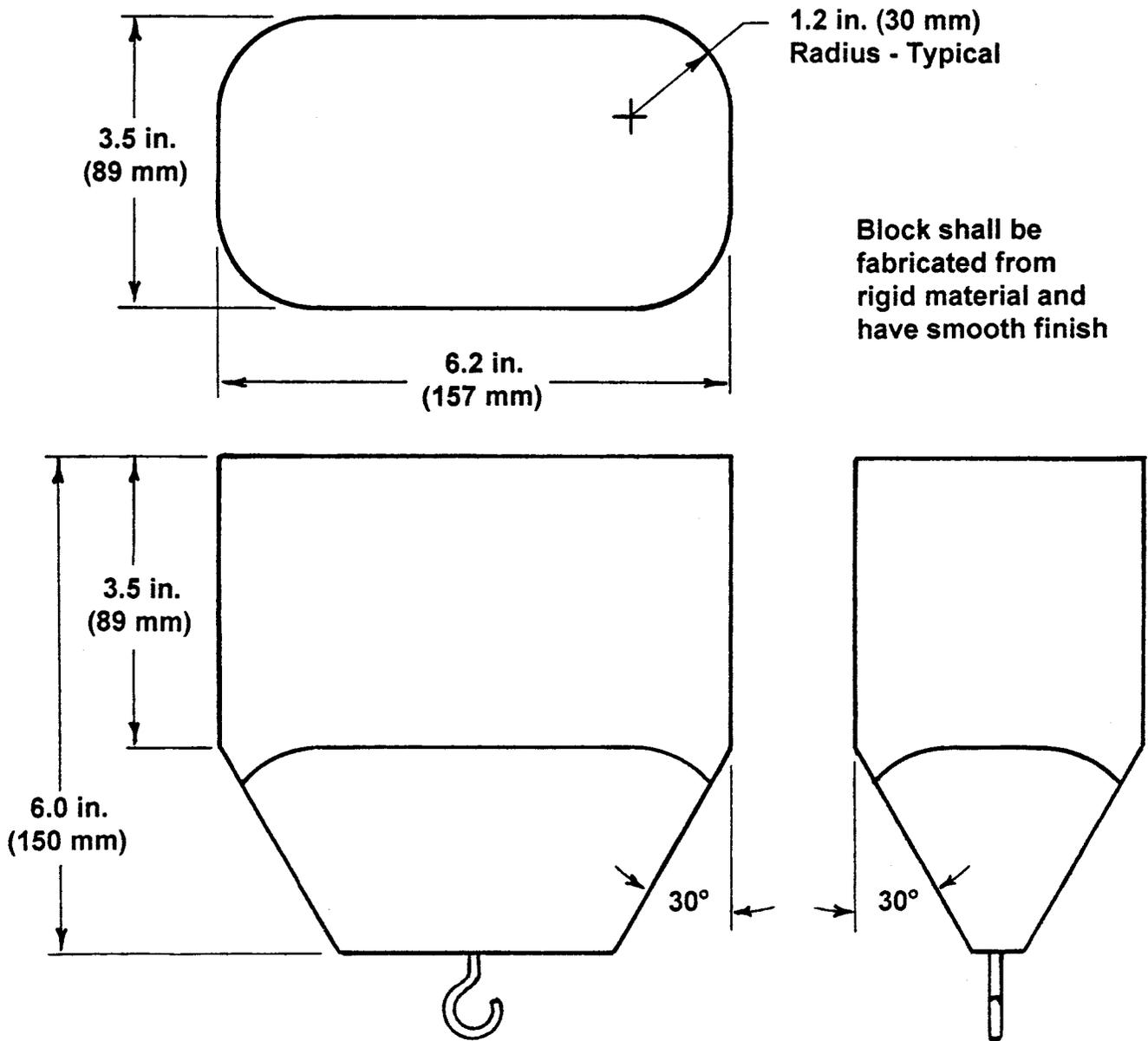
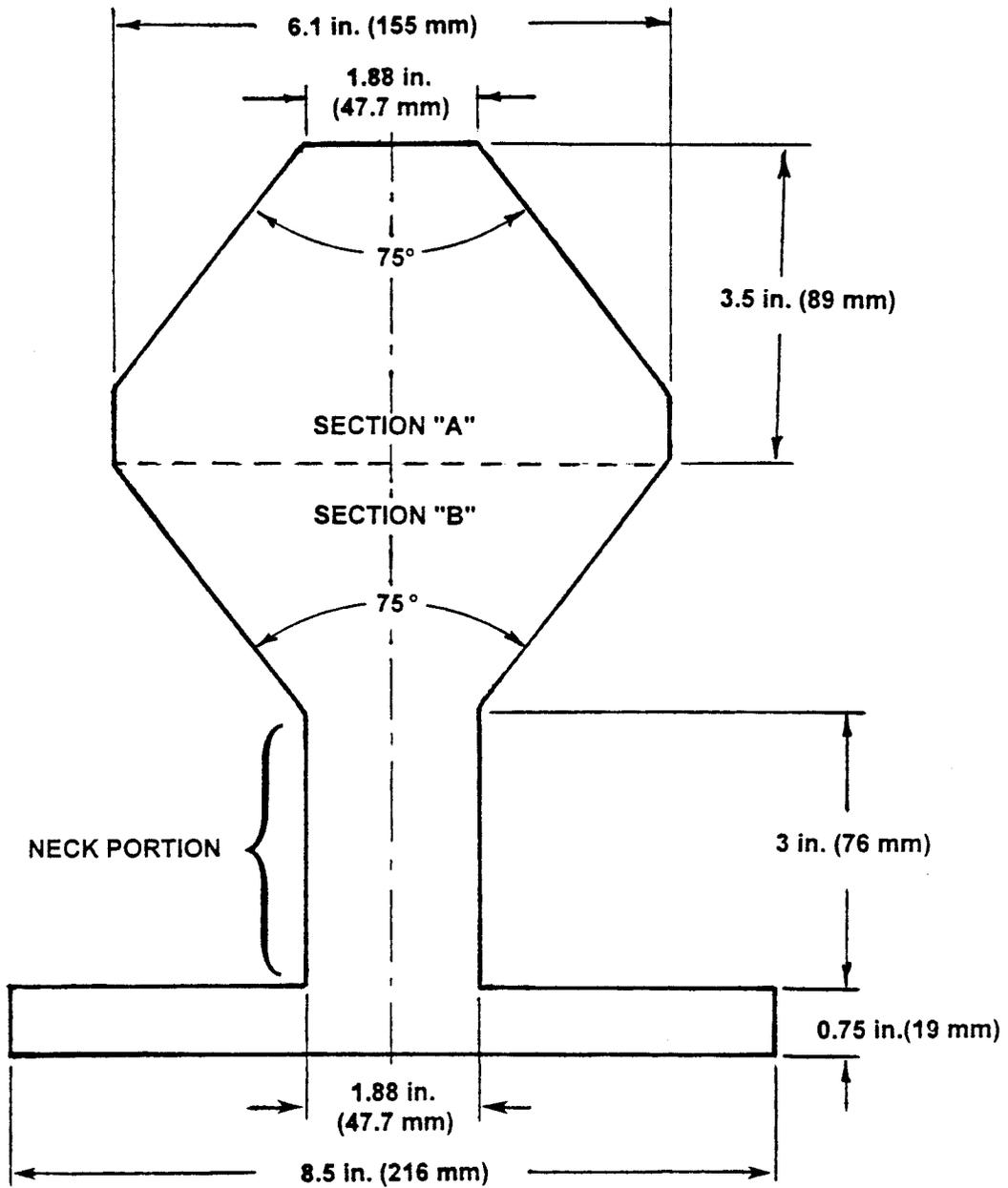


Figure 1 to Part 1213 - Wedge Block for Tests in § 1213.4(a), (b) and (c)

Figure 2 to Part 1213—Test Template for Neck Entrapment



NOTE - Probe to be constructed from any rigid material 0.75 in. (19 mm) thick

Fig. 2 - Test Probe for Neck Entrapment

Figure 3 to Part 1213—Motion of Test Template Arrested by Simultaneous Contact With Both Sides of “A” Section and Boundaries of Opening

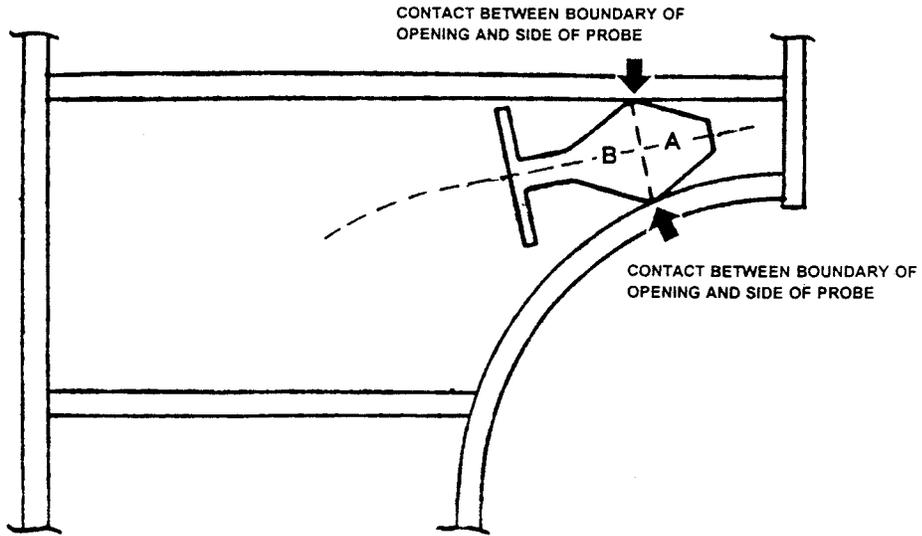


Fig. 3 – Motion of Test Probe Arrested by Simultaneous Contact With Both Sides of “A” Section of Probe and Boundaries of Opening

Figure 4 to Part 1213—Neck Portion of “B” Section of Template Enters Completely Into Opening

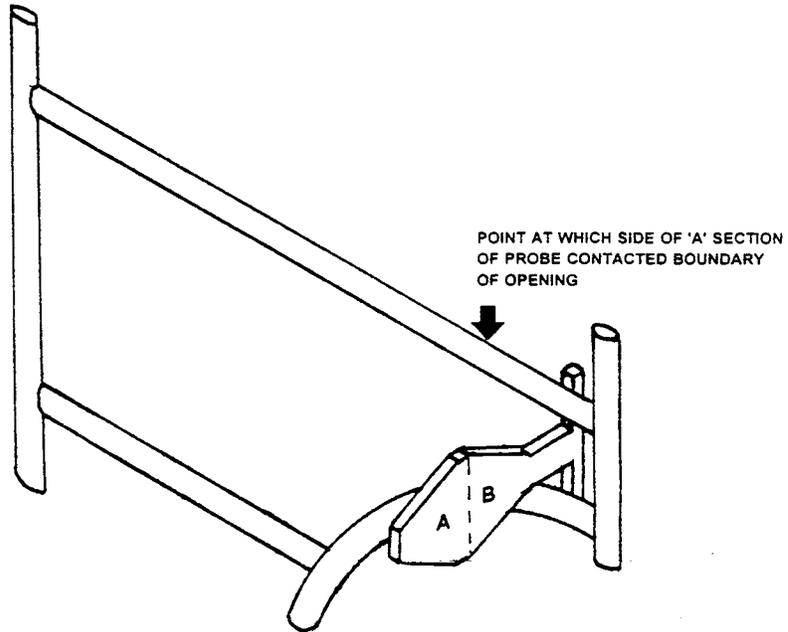


Fig 4 – Neck Portion of “B” Section of Probe Enters Completely into Opening

BILLING CODE 6355-01-C

Appendix to Part 1213—Findings Under the Consumer Product Safety Act

The Consumer Product Safety Act requires that the Commission, in order to issue a standard, make the following findings and include them in the rule. 15 U.S.C. 2058(f)(3). Because of this, the facts and determinations in these findings apply as of the date the rule was issued, December 22, 1999.

A. *The rule in this part (including its effective date of June 19, 2000) is reasonably necessary to eliminate or reduce an unreasonable risk of injury associated with the product.*

1. For a recent 9.6-year period, the CPSC received reports of 57 deaths of children under age 15 who died when they were trapped between the upper bunk of a bunk bed and the wall or when they were trapped in openings in the bed's structure. Over 96% of those who died in entrapment incidents were age 3 or younger. On average, averting these deaths is expected to produce a benefit to society with a present value of about \$175 to \$350 for each bed that otherwise would not have complied with one or more of the rule's requirements.

2. This increased safety will be achieved in two ways. First, all bunk beds will be required to have a guardrail on both sides of the bed. If the bed is placed against a wall, the guardrail on that side is expected to prevent a child from being entrapped between the bed and the wall. The guardrail on the wall side of the bed must extend continuously from one end to the other. Second, the end structures of the bed must be constructed so that, if an opening in the end structure is large enough so a child can slip his or her body through it, it must be large enough that the child's head also can pass through.

3. For the reasons discussed in paragraph D. of this Appendix, the benefits of the changes to bunk beds caused by this rule will have a reasonable relationship to the changes' costs. The rule addresses a risk of death, and applies primarily to a vulnerable population, children under age 3. The life-saving features required by the rule are cost-effective and can be implemented without adversely affecting the performance and availability of the product. The effective date provides enough time so that production of bunk beds that do not already comply with the standard can easily be changed so that the beds comply. Accordingly, the Commission finds that the rule (including its effective date) is reasonably necessary to eliminate or reduce an unreasonable risk of injury associated with the product.

B. *Promulgation of the rule is in the public interest.* For the reasons given in paragraph A. of this Appendix, the Commission finds that promulgation of the rule is in the public interest.

C. *Where a voluntary standard has been adopted and implemented by the affected industry, that compliance with such voluntary standard is not likely to result in the elimination or adequate reduction of the risk of injury; or it is unlikely that there will be substantial compliance with such voluntary standard.*

1. *Adequacy of the voluntary standard. i.* In this instance, there is a voluntary standard

addressing the risk of entrapment in bunk beds. However, the rule goes beyond the provisions of the voluntary standard. First, it eliminates the voluntary standard's option to have an opening of up to 15 inches at each end of the wall-side guardrail. Second, it requires more of the lower bunk end structures to have entrapment protection. The voluntary standard protects against entrapment only within the 9-inch space immediately above the upper surface of the lower bunk's mattress. The mandatory standard extends this area of protection upward to the level of the underside of the upper bunk foundation. Both of these provisions, which are in the rule but not in the voluntary standard, address fatalities and, as noted in paragraph D of this Appendix, have benefits that bear a reasonable relationship to their costs.

ii. Therefore, the Commission finds that compliance with the voluntary standard is not likely to result in the elimination or adequate reduction of the risk of entrapment injury or death.

2. *Substantial compliance. i.* Neither the CPSCA nor the FHSA define "substantial compliance." The March 3, 1999 Notice of Proposed Rulemaking summarized an interpretation of "substantial compliance" that the Office of General Counsel provided to the Commission. 64 Fed. Reg. 10245, 10248-49 (March 3, 1999). The Commission specifically invited public comment on that interpretation from "all persons who would be affected by such an interpretation." *Id.* at 10249. The Commission received more than 20 comments on the interpretation.

ii. Having now considered all the evidence that the staff has presented, the comments from the public, and the legal advice from the Office of General Counsel, the Commission concludes that there is not "substantial compliance" with the ASTM voluntary standard for bunk beds within the meaning of the Consumer Product Safety Act and the Federal Hazardous Substances Act. See, e.g., 15 U.S.C. 2058(f)(3)(D)(ii); 15 U.S.C. 1262(i)(2)(A)(ii). However, the Commission does not adopt a general interpretation of "substantial compliance" focusing on whether the level of compliance with a voluntary standard could be improved under a mandatory standard. Rather, the grounds for the Commission's decision focus on the specific facts of this rulemaking and are stated below.

iii. The legislative history regarding the meaning of "substantial compliance" indicates that the Commission should consider whether compliance is sufficient to eliminate or adequately reduce the risk of injury in a timely fashion and that, generally, compliance should be measured in terms of the number of complying products, rather than the number of manufacturers who are in compliance. E.g., Senate Report No. 97-102, p. 14 (May 15, 1981); House Report No. 97-158, p. 11 (June 19, 1981); H. Conf. Rep. No. 97-208, 97th Cong., 1st Sess. 871, reprinted in 1981 U.S. Code Cong. & Admin. News 1010, 1233.

iv. Given this Congressional guidance, the Commission believes it appropriate to examine the number of conforming products as the starting point for analysis. However,

the Commission does not believe that there is any single percentage of conforming products that can be used in all cases to define "substantial compliance." Instead, the percentage must be viewed in the context of the hazard the product presents. Thus, the Commission must examine what constitutes substantial compliance with a voluntary standard in light of its obligation to safeguard the American consumer.

v. There are certain factors the agency considers before it initiates regulatory action, such as the severity of the potential injury, whether there is a vulnerable population at risk, and the risk of injury. See 16 CFR 1009.8. These and other factors also appropriately inform the Commission's decision regarding whether a certain level of conformance with a voluntary standard is substantial. In the light of these factors, industry's compliance rate with the voluntary standard for bunk beds is not substantial.

vi. In this case, the Commission deals with the most severe risk—death—to one of the most vulnerable segments of our population—infants and young children. While the risk of death is not high, it exists whenever a young child is in a residence with a nonconforming bunk bed.

vii. Additionally, some products, such as hairdryers without shock protection devices, require some intervening action (dropping the hair dryer into water) to create the hazard. By contrast, deaths in bunk beds occur during the intended use of the product—a child rolling over in bed or climbing in or out of it—without any intervening action.

viii. The Commission must also consider that bunk beds have a very long product life, frequently being passed on to several families before being discarded. Thus, a number of children may be exposed to a bed during its useful life. Every noncomplying bed that poses an entrapment hazard presents the potential risk of death to any young child in the house. It is a risk that is hard for a parent to protect against, as children find their way onto these beds even if they are not put to sleep in them.

ix. Bunk beds are products that can be made relatively easily by very small companies, or even by a single individual. The Office of Compliance believes smaller entities will always present a compliance problem, because new manufacturers can enter the marketplace relatively easily and need little expertise to make a wooden bunk bed. The evidence seems to support the view that there will always be an irreducible number of new, smaller bunk bed manufacturers who will not follow the voluntary standard.

x. What constitutes substantial compliance is also a function of what point in time the issue is examined. In 1989, the Commission denied a petition for a mandatory bunk bed rule. At that time, industry was predicting that by April of 1989, 90% of all beds being manufactured would comply with the voluntary guidelines. But that was in the context of years of steadily increasing conformance and the hope that conformance would continue to grow and that deaths and near-misses would begin to decline. But the

conformance level never grew beyond the projection for 1989 and deaths and near-misses have not dropped.

xi. Even with the existing compliance rate, the Commission is contemplating the prospect of perhaps 50,000 nonconforming beds a year (or more) entering the marketplace, with many beds remaining in use for perhaps 20 years or longer. Under these circumstances, a 10% rate of noncompliance is too high.

xii. It is now clear that the bunk bed voluntary standard has not achieved an adequate reduction of the unreasonable risk of death to infants and children in a timely fashion, and it is unlikely to do so. Accordingly, the Commission finds that substantial compliance with the voluntary standard for bunk beds is unlikely.

xiii. Products that present some or all of the following factors might not be held to as strict a substantial compliance analysis. Those which:

- Rarely or never cause death;
- Cause only less severe injuries;
- Do not cause deaths or injuries principally to a vulnerable segment of the population;
- Are not intended for children and which have no special attraction for children;
- Have a relatively short life span;
- Are made by a few stable manufacturers or which can only be made by specialized manufacturers needing a significant manufacturing investment to produce the product;
- Are covered by a voluntary standard which continues to capture an increasing amount of noncomplying products; or
- Require some additional intervening action to be hazardous.

xiv. And, in analyzing some other product, there could be other factors that would have to be taken into consideration in determining what level of compliance is adequate to protect the public. The tolerance for nonconformance levels has to bear some relationship to the magnitude and manageability of the hazard addressed.

xv. The Commission emphasizes that its decision is not based on the argument that a mandatory rule provides more powerful enforcement tools. If this were sufficient rationale, mandatory rules could always displace voluntary standards, and this clearly was not Congress's intent. But, with a mandatory standard, the necessity of complying with a mandatory federal regulation will be understandable to small manufacturers. State and local governments will have no doubt about their ability to help us in our efforts to locate these manufacturers.

D. *The benefits expected from the rule bear a reasonable relationship to its costs.*

1. *Bunk beds that do not comply with ASTM's requirements for guardrails.* The cost of providing a second guardrail for bunk beds that do not have one is expected to be from \$15–40 per otherwise noncomplying bed. If, as expected, the standard prevents virtually all of the deaths it addresses, the present value of the benefits of this modification are estimated to be from \$175–350 per otherwise noncomplying bed. Thus, the benefit of this provision is about 4–23 times its cost.

2. *Bunk beds that comply with ASTM's requirements for guardrails.* The voluntary

standard allows up to a 15-inch gap in the coverage of the guardrail on the wall side of the upper bunk. Additional entrapment deaths are addressed by requiring that the wall-side guardrail be continuous from one end of the bed to the other. The estimated present value of the benefits of this requirement is \$2.40 to \$3.50 per otherwise noncomplying bed. The Commission estimates that the materials cost to extend one guardrail an additional 30 inches (760 mm) will be less than the present value of the benefits of making the change. Further, the costs of any design changes can be amortized over the number the bunk beds manufactured after the design change is made. Thus, the costs of any design change will be nominal.

3. *Lower bunk end structures.* The Commission is aware of a death, involving entrapment in the end structures of the lower bunk, occurring in a scenario not currently addressed by the voluntary standard. This death would be addressed by extending the voluntary standard's lower bunk end structures entrapment provisions from 9 inches above the lower bunk's sleeping surface to the bottom of the upper bunk and by also including a test for neck entrapment in this area. The Commission expects the costs of this requirement to be design-related only, and small. Indeed, for some bunk beds, materials costs may decrease since less material may be required to comply with these requirements than is currently being used. Again, the design costs for these modifications to the end structures can be amortized over the subsequent production run of the bed.

4. *Effect on market.* The small additional costs from any wall-side guardrails and end-structure modifications are not expected to affect the market for bunk beds, either alone or added to the costs of compliance to ASTM's provisions.

5. *Conclusion.* The Commission has no reason to conclude that any of the standard's requirements will have costs that exceed the requirement's expected benefits. Further, the total effect of the rule is that the benefits of the rule will exceed its costs by about 4–23 times. Accordingly, the Commission concludes that the benefits expected from the rule bear a reasonable relationship to its costs.

E. *The rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury for which the rule is being promulgated.* 1. The Commission considered relying on the voluntary standard, either alone or combined with a third-party certification program. However, the Commission concluded that a mandatory program will be more effective in reducing these deaths, each of which is caused by an unreasonable risk of entrapment. Accordingly, these alternatives would not prevent or adequately reduce the risk of injury for which the rule is being promulgated.

2. The Commission also considered a suggestion that bunk beds that conformed to the voluntary standard be so labeled. Consumers could then compare conforming and nonconforming beds at the point of purchase and make their purchase decisions with this safety information in mind. This,

however, would not necessarily reduce injuries, because consumers likely would not know there is a voluntary standard and thus would not see any risk in purchasing a bed that was not labeled as conforming to the standard.

3. For the reasons stated in this Appendix, no alternatives to a mandatory rule have been suggested that would adequately reduce the deaths caused by entrapment of children in bunk beds. Accordingly, the Commission finds that this rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury for which the rule is being promulgated.

2. The authority citation for part 1500 continues to read as follows:

Authority: 15 U.S.C. 1261–1278.

3. Section 1500.18 is amended by adding paragraph (a)(18) to read as follows:

§ 1500.18 Banned toys and other banned articles intended for use by children.

(a) * * *

(18)(i) Any bunk bed (as defined in § 1513.2(c) of this chapter) that does not comply with the requirements of part 1513 of this chapter.

(ii) *Findings.* In order to issue a rule under Section 3(e) of the Federal Hazardous Substances Act (FHSA), 15 U.S.C. 1262(e), classifying a toy or other article intended for use by children as a hazardous substance on the basis that it presents a mechanical hazard (as defined in Section 2(s) of the FHSA), the FHSA requires the Commission to make the following findings and to include these findings in the regulation: Bunk beds present a mechanical hazard; Where a voluntary standard has been adopted and implemented by the affected industry, that compliance with such voluntary standard is not likely to result in the elimination or adequate reduction of the risk of injury, or it is unlikely that there will be substantial compliance with such voluntary standard; The benefits expected from the rule bear a reasonable relationship to its costs; and The rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury for which the rule is being promulgated. These findings are made in the Appendix to Part 1513.

4. A new part 1513 is added to Subchapter C to read as follows:

PART 1513—REQUIREMENTS FOR BUNK BEDS

Sec.

- 1513.1 Scope, application, and effective date.
- 1513.2 Definitions.
- 1513.3 Requirements.
- 1513.4 Test methods.
- 1513.5 Marking and labeling.
- 1513.6 Instructions.

Figures 1–4

Appendix to Part 1513—Findings Under the Federal Hazardous Substances Act

Authority: 15 U.S.C. 1261(f)(1)(D), 1261(s), 1262(e)(1), 1262(f)–(i).

§ 1513.1 Scope, application, and effective date.

(a) *Scope, basis, and purpose.* This part 1513 prescribes requirements for bunk beds to reduce or eliminate the risk that children will die or be injured from being trapped between the upper bunk and the wall or in openings below guardrails or in other structures in the bed. Bunk beds meeting these requirements are exempted from 16 CFR 1500.18(a)(18).

(b) *Application and effective date.* This part applies to all bunk beds, except those manufactured only for institutional use, that are manufactured in the United States, or imported, on or after June 19, 2000. (Facilities intended for use by children under age 6 are not considered to be institutions.) Bunk beds, as described in this section, that are not intended for use by children are subject to the requirements in 16 CFR part 1213, and not to 16 CFR 1500.18(a)(18). However, the provisions of 16 CFR 1213 are substantively identical to the requirements in this part 1513.

§ 1513.2 Definitions.

As used in this part 1513:

Bed. See *Bunk bed*.

Bed end structure means an upright unit at the head and foot of the bed to which the side rails attach.

Bunk bed means a bed in which the underside of any foundation is over 30 inches (760 mm) from the floor.

Foundation means the base or support on which a mattress rests.

Guardrail means a rail or guard on a side of the upper bunk to prevent a sleeping occupant from falling or rolling out.

§ 1513.3 Requirements.

(a) *Guardrails.* (1) Any bunk bed shall provide at least two guardrails, at least one on each side of the bed, for each bed having the underside of its foundation more than 30 inches (760 mm) from the floor.

(2) One guardrail shall be continuous between each of the bed's end structures. "Continuous" means that any gap between the guardrail and end structure shall not exceed 0.22 inches (5.6 mm) (so as to not cause a finger entrapment hazard for a child).

(3) The other guardrail may terminate before reaching the bed's end structures, providing there is no more than 15 inches (380 mm) between either end of

the guardrail and the nearest bed end structure.

(4) For bunk beds designed to have a ladder attached to one side of the bed, the continuous guardrail shall be on the other side of the bed.

(5) Guardrails shall be attached so that they cannot be removed without either intentionally releasing a fastening device or applying forces sequentially in different directions.

(6) The upper edge of the guardrails shall be no less than 5 inches (130 mm) above the top surface of the mattress when a mattress of the maximum thickness specified by the manufacturer's instructions is on the bed. This requirement does not prohibit a wall-side guardrail that terminates in a quarter-circle bend and attaches to the side rail of the upper bunk foundation.

(7) With no mattress on the bed, there shall be no openings in the structure between the lower edge of the uppermost member of the guardrail and the underside of the upper bunk's foundation that would permit passage of the wedge block shown in Figure 1 of this part when tested in accordance with the procedure at § 1513.4(a).

(b) *Bed end structures.* (1) The upper edge of the upper bunk end structures shall be at least 5 inches (130 mm) above the top surface of the mattress for at least 50 percent of the distance between the two posts at the head and foot of the upper bunk when a mattress and foundation of the maximum thickness specified by the manufacturer's instructions is on the bed.

(2) With no mattress on the bed, there shall be no openings in the rigid end structures above the foundation of the upper bunk that will permit the free passage of the wedge block shown in Figure 1 when tested in accordance with the procedure at § 1513.4(b).

(3) When tested in accordance with § 1513.4(c), there shall be no openings in the end structures between the underside of the foundation of the upper bunk and upper side of the foundation of the lower bunk that will permit the free passage of the wedge block shown in Figure 1, unless the openings are also large enough to permit the free passage of a 9-inch (230-mm) diameter rigid sphere.

(4) All portions of the boundary of any opening required by §§ 1513.4(c)(1) and (2) to be probed by the wedge block of Figure 1, and that permits free passage of a 9-inch diameter sphere, must conform to the neck entrapment requirements of § 1513.4(c)(3).

§ 1513.4 Test methods.

(a) *Guardrails* (see § 1513.3(a)(6)). With no mattress on the bed, place the wedge block shown in Figure 1, tapered side first, into each opening in the rigid bed structure below the lower edge of the uppermost member of the guardrail and above the underside of the upper bunk's foundation. Orient the block so that it is most likely to pass through the opening (e.g., the major axis of the block parallel to the major axis of the opening) ("most adverse orientation"). Then, gradually apply a 33-lbf (147-N) force in a direction perpendicular to the plane of the large end of the block. Sustain the force for 1 minute.

(b) *Upper bunk end structure* (see § 1513.3(b)(2)). Without a mattress or foundation on the upper bunk, place the wedge block shown in Figure 1 into any opening, tapered side first, and in the most adverse orientation. Determine if the wedge block can pass freely through the opening.

(c) *Lower bunk end structure* (see § 1513.3(b)(3)). (1) Without a mattress or foundation on the lower bunk, place the wedge block shown in Figure 1, tapered side first, into each opening in the lower bunk end structure in the most adverse orientation. Determine whether the wedge block can pass freely through the opening. If the wedge block passes freely through the opening, determine whether a 9-inch (230-mm) diameter rigid sphere can pass freely through the opening.

(2) With the manufacturer's recommended maximum thickness mattress and foundation in place, repeat the test in paragraph (c)(1) of this section.

(3) All portions of the boundary of any opening that is required to be probed by the wedge block of Figure 1 by paragraphs (c)(1) and (c)(2) of this section, and that permits free passage of a 9-inch diameter sphere, must satisfy the requirements of paragraphs (c)(3)(i) and (c)(3)(ii) of this section addressing neck entrapment:

(i) Insert the "A" section of the test template shown in Figure 2 of this part into the portion of the boundary to be tested, with the plane of the template in the plane of the opening and with the centerline of the top of the template (as shown in Figure 2) aligned parallel to the centerline of the opening, until motion is stopped by contact between the test template and the boundaries of the opening (see Figure 3 of this part). By visual inspection, determine if there is simultaneous contact between the boundary of the opening and both sides of the "A" section of the template. If simultaneous contact occurs, mark the contact points on the boundary of the

opening and conduct the additional test described in paragraph (c)(3)(ii) of this section.

(ii) To check the potential for neck entrapment, place the neck portion of the "B" section of the template into the opening, with its plane perpendicular to both the plane of the opening and the centerline of the opening (see Figure 4 of this part). If the neck portion of the "B" section of the template can completely enter the opening (passes 0.75 inch or more beyond the points

previously contacted by the "A" section of the template), the opening is considered to present a neck entrapment hazard and fails the test, unless its lower boundary slopes downward at 45° or more for the whole distance from the narrowest part of the opening the neck can reach to the part of the opening that will freely pass a 9-inch diameter sphere.

§ 1513.5 Marking and labeling.

(a) There shall be a permanent label or marking on each bed stating the name

and address (city, state, and zip code) of the manufacturer, distributor, or retailer; the model number; and the month and year of manufacture.

(b) The following warning label shall be permanently attached to the inside of an upper bunk bed end structure in a location that cannot be covered by the bedding but that may be covered by the placement of a pillow.

BILLING CODE 6358-01-P

<p>△ WARNING</p>
<p>To help prevent serious or fatal injuries from entrapment or falls:</p> <ul style="list-style-type: none"> • Never allow a child under 6 years on upper bunk • Use only a mattress that is ___ inches long and ___ inches wide on upper bunk • Ensure thickness of mattress and foundation combined does not exceed ___ inches and that mattress surface is at least 5 inches below upper edge of guardrails <p style="text-align: center; font-weight: bold; margin-top: 10px;">DO NOT REMOVE THIS LABEL</p>

BILLING CODE 6355-01-C

§ 1513.6 Instructions

Instructions shall accompany each bunk bed set, and shall include the following information.

(a) *Size of mattress and foundation.* The length and width of the intended mattress and foundation shall be clearly stated, either numerically or in conventional terms such as twin size, twin extra-long, etc. In addition, the maximum thickness of the mattress and

foundation required for compliance with § 1513.3 (a)(5) and (b)(1) of this part shall be stated.

(b) *Safety warnings.* The instructions shall provide the following safety warnings:

- (1) Do not allow children under 6 years of age to use the upper bunk.
- (2) Use guardrails on both sides of the upper bunk.
- (3) Prohibit horseplay on or under beds.

(4) Prohibit more than one person on upper bunk.

(5) Use ladder for entering or leaving upper bunk.

(6) If the bunk bed will be placed next to a wall, the guardrail that runs the full length of the bed should be placed against the wall to prevent entrapment between the bed and the wall. (This applies only to bunk beds without two full-length guardrails.)

BILLING CODE 6355-01-P

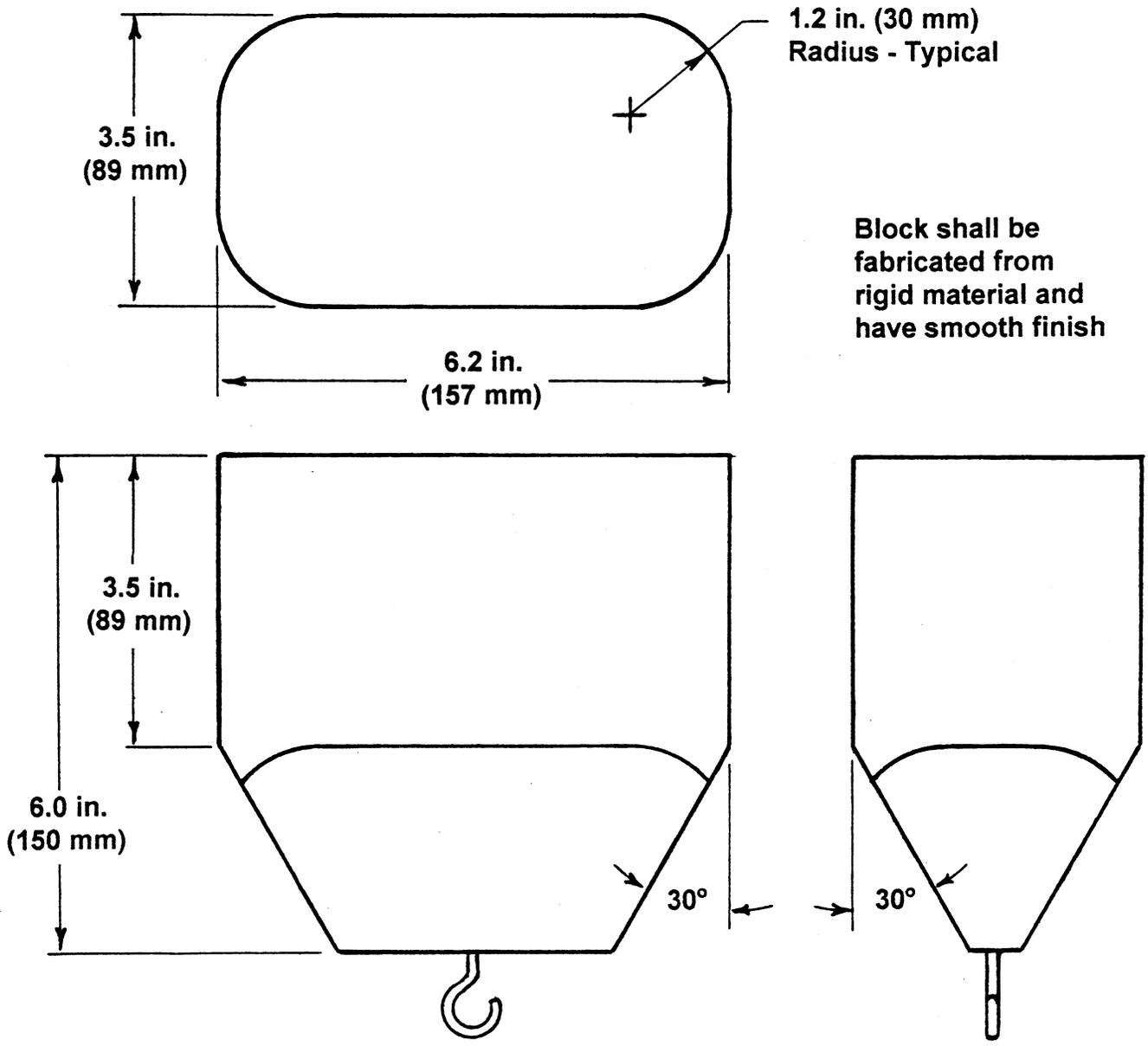
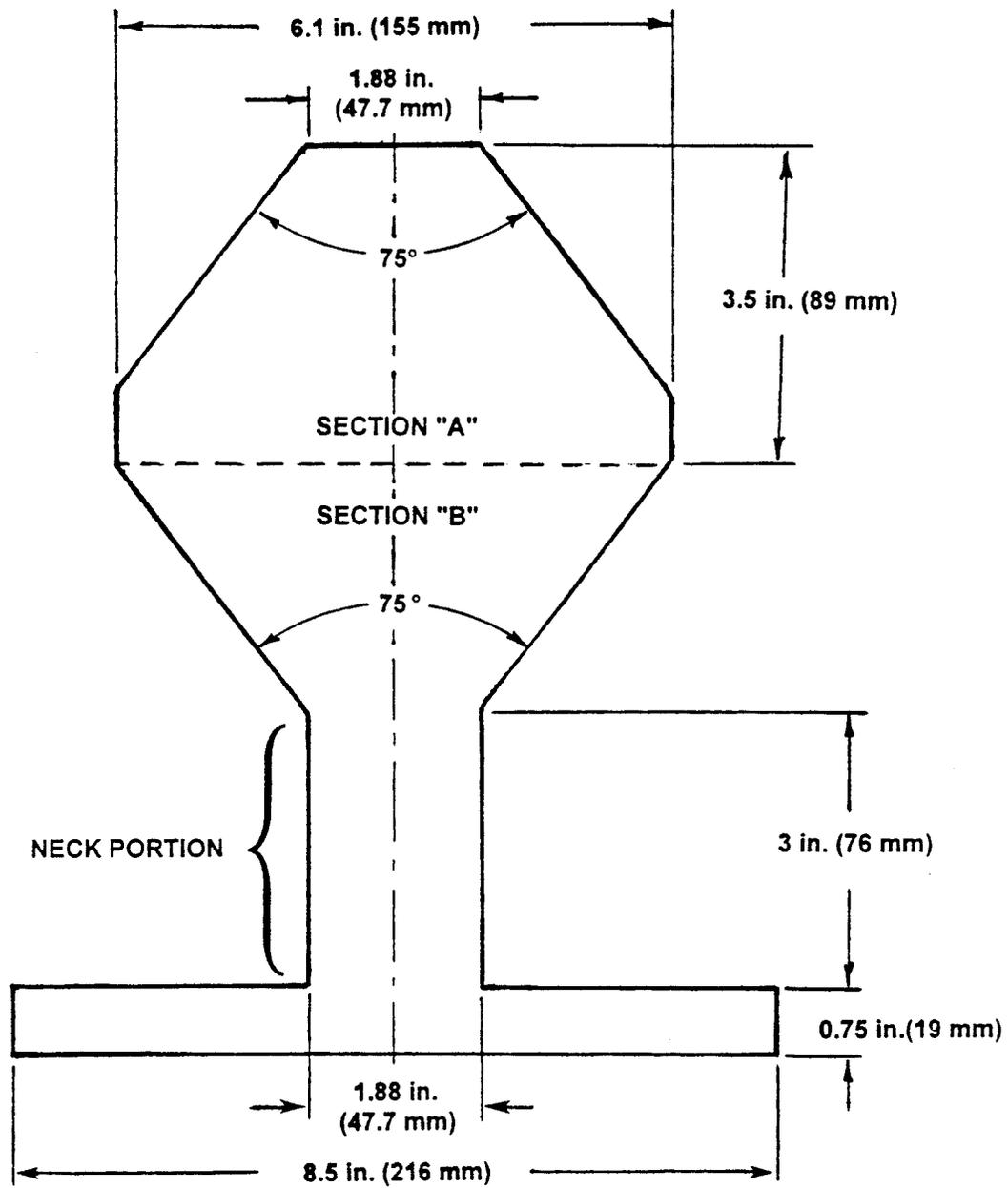


Figure 1 to Part 1513 - Wedge Block for Tests in § 1513.4(a), (b) and (c)



NOTE - Probe to be constructed from any rigid material 0.75 in. (19 mm) thick

Fig. 2 - Test Probe for Neck Entrapment

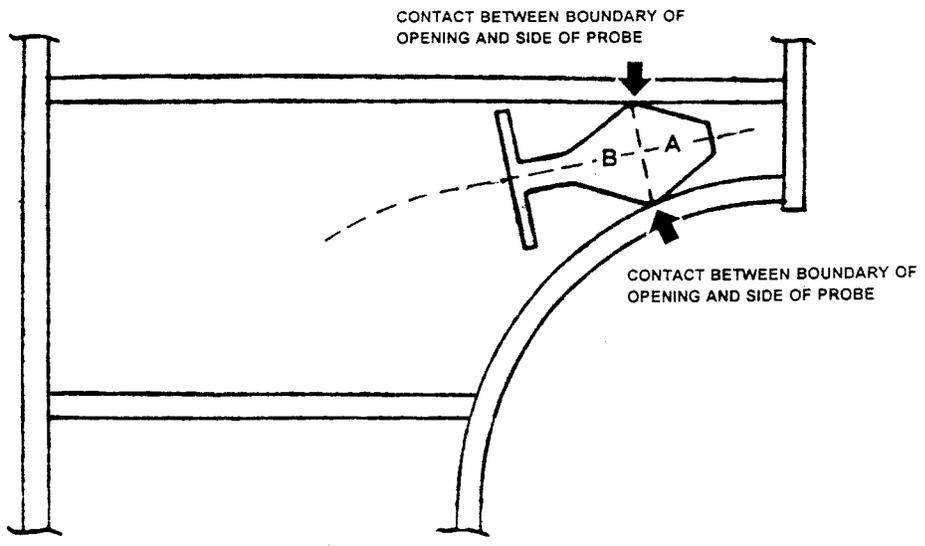


Fig. 3 – Motion of Test Probe Arrested by Simultaneous Contact With Both Sides of “A” Section of Probe and Boundaries of Opening

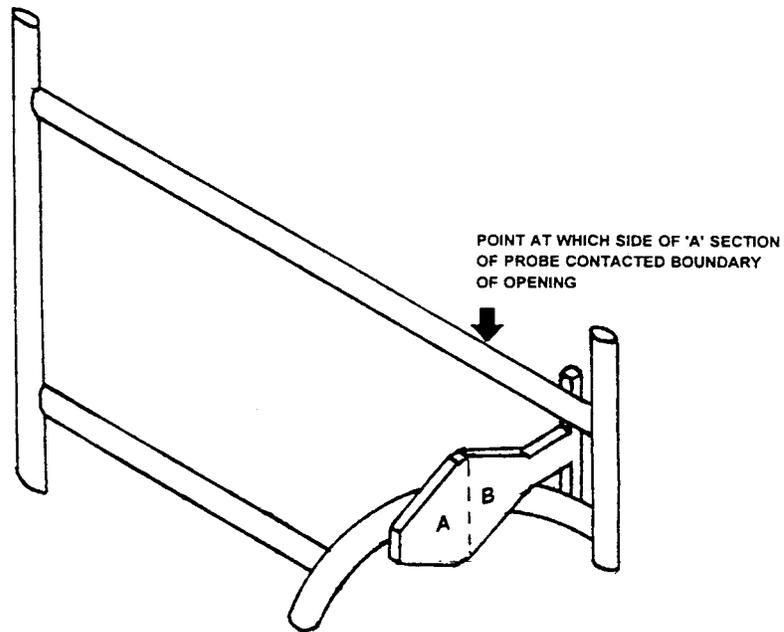


Fig 4 – Neck Portion of “B” Section of Probe Enters Completely into Opening

BILLING CODE 6355-01-C

Appendix to Part 1513—Findings Under the Federal Hazardous Substances Act

The Federal Hazardous Substances Act (FHSA) requires that the Commission, in order to issue Part 1513, make the following findings and include them in the rule. 15 U.S.C. 1261(s), 1262(i). Because of this, the facts and determinations in these findings apply as of the date the rule was issued, December 22, 1999.

A. *Bunk beds present a mechanical hazard.* Section 2(s) of the FHSA states that an "article may be determined to present a mechanical hazard if, in normal use or when subjected to reasonably foreseeable damage or abuse, its design or manufacture presents an unreasonable risk of personal injury or illness * * * (3 from * * * surfaces, edges, openings, or closures * * * , or (9) because of any other aspect of the articles design or manufacture." 15 U.S.C. 1261(s).

2. For a recent 9.6-year period, the CPSC received reports of 57 deaths of children under age 15 who died when they were trapped between the upper bunk of a bunk bed and the wall or when they were trapped in openings in the bed's structure. Over 96% of those who died in entrapment incidents were age 3 or younger. On average, averting these deaths is expected to produce a benefit to society with a present value of about \$175 to \$350 for each bed that otherwise would not have complied with one or more of the rule's requirements.

3. This increased safety will be achieved in three main ways. First, all bunk beds will be required to have a guardrail on both sides of the bed. If the bed is placed against a wall, the guardrail on that side is expected to prevent a child from being entrapped between the bed and the wall. The guardrail on the wall side of the bed must extend continuously from one end to the other. Second, the end structures of the bed must be constructed so that, if an opening in the end structure is large enough so a child can slip his or her body through it, it must be large enough that the child's head also can pass through. Third, this area must also be constructed so that a child cannot insert his or her head into an opening and move to another part of the opening where the head cannot be pulled out and the neck can become entrapped.

4. For the reasons discussed in paragraph C of this Appendix, the benefits of the changes to bunk beds caused by this rule will have a reasonable relationship to the changes' costs. The rule addresses a risk of death, and applies primarily to a vulnerable population, children under age 3. The life-saving features required by the rule are cost-effective and can be implemented without adversely affecting the performance and availability of the product. The effective date provides enough time so that production of bunk beds that do not already comply with the standard can easily be changed so that the beds comply. Accordingly, the Commission finds that there is an unreasonable risk of entrapment injury associated with bunk beds that do not comply with Part 1513.

B. *Where a voluntary standard has been adopted and implemented by the affected*

industry, that compliance with such voluntary standard is not likely to result in the elimination or adequate reduction of the risk of injury, or it is unlikely that there will be substantial compliance with such voluntary standard.

1. *Adequacy of the voluntary standard.* In this instance, there is a voluntary standard addressing the risk of entrapment in bunk beds. However, the rule goes beyond the provisions of the voluntary standard. First, it eliminates the voluntary standard's option to have an opening of up to 15 inches at each end of the wall-side guardrail. Second, it requires more of the lower bunk end structures to have entrapment protection. The voluntary standard protects against entrapment only within the 9-inch space immediately above the upper surface of the lower bunk's mattress. The mandatory standard extends this area of protection upward to the level of the underside of the upper bunk foundation. Both of these provisions, which are in the rule but not in the voluntary standard, address fatalities and, as noted in this paragraph (a)(18), have benefits that bear a reasonable relationship to their costs.

Therefore, the Commission finds that compliance with the voluntary standard is not likely to result in the elimination or adequate reduction of the risk of entrapment injury or death.

2. *Substantial compliance.* i. The FHSA does not define "substantial compliance." The March 3, 1999 Notice of Proposed Rulemaking summarized an interpretation of "substantial compliance" that the Office of General Counsel provided to the Commission. 64 FR 10245, 10248-49 (March 3, 1999). The Commission specifically invited public comment on that interpretation from "all persons who would be affected by such an interpretation." Id. at 10249. The Commission received more than 20 comments on the interpretation.

ii. Having now considered all the evidence that the staff has presented, the comments from the public, and the legal advice from the Office of General Counsel, the Commission concludes that there is not "substantial compliance" with the ASTM voluntary standard for bunk beds within the meaning of the Consumer Product Safety Act and the Federal Hazardous Substances Act. See, e.g., 15 U.S.C. 2058(f)(3)(D)(ii); 15 U.S.C. 1262(i)(2)(A)(ii). However, the Commission does not adopt a general interpretation of "substantial compliance" focusing on whether the level of compliance with a voluntary standard could be improved under a mandatory standard. Rather, the grounds for the Commission's decision focus on the specific facts of this rulemaking and are stated below.

iii. The legislative history regarding the meaning of "substantial compliance" indicates that the Commission should consider whether compliance is sufficient to eliminate or adequately reduce the risk of injury in a timely fashion and that, generally, compliance should be measured in terms of the number of complying products, rather than the number of manufacturers who are in compliance. E.g., Senate Report No. 97-102, p. 14 (May 15, 1981); House Report No. 97-

158, p. 11 (June 19, 1981); H. Conf. Rep. No. 97-208, 97th Cong., 1st Sess. 871, reprinted in 1981 U.S. Code Cong. & Admin. News 1010, 1233.

iv. Given this Congressional guidance, the Commission believes it appropriate to examine the number of conforming products as the starting point for analysis. However, the Commission does not believe that there is any single percentage of conforming products that can be used in all cases to define "substantial compliance." Instead, the percentage must be viewed in the context of the hazard the product presents. Thus, the Commission must examine what constitutes substantial compliance with a voluntary standard in light of its obligation to safeguard the American consumer.

v. There are certain factors the agency considers before it initiates regulatory action, such as the severity of the potential injury, whether there is a vulnerable population at risk, and the risk of injury. See 16 CFR 1009.8. These and other factors also appropriately inform the Commission's decision regarding whether a certain level of conformance with a voluntary standard is substantial. In the light of these factors, industry's compliance rate with the voluntary standard for bunk beds is not substantial.

vi. In this case, the Commission deals with the most severe risk—death—to one of the most vulnerable segments of our population—infants and young children. While the risk of death is not high, it exists whenever a young child is in a residence with a nonconforming bunk bed.

vii. Additionally, some products, such as hairdryers without shock protection devices, require some intervening action (dropping the hair dryer into water) to create the hazard. By contrast, deaths in bunk beds occur during the intended use of the product—a child rolling over in bed or climbing in or out of it—without any intervening action.

viii. The Commission must also consider that bunk beds have a very long product life, frequently being passed on to several families before being discarded. Thus, a number of children may be exposed to a bed during its useful life. Every noncomplying bed that poses an entrapment hazard presents the potential risk of death to any young child in the house. It is a risk that is hard for a parent to protect against, as children find their way onto these beds even if they are not put to sleep in them.

ix. Bunk beds are products that can be made relatively easily by very small companies, or even by a single individual. The Office of Compliance believes smaller entities will always present a compliance problem, because new manufacturers can enter the marketplace relatively easily and need little expertise to make a wooden bunk bed. The evidence seems to support the view that there will always be an irreducible number of new, smaller bunk bed manufacturers who will not follow the voluntary standard.

x. What constitutes substantial compliance is also a function of what point in time the issue is examined. In 1989, the Commission denied a petition for a mandatory bunk bed

rule. At that time, industry was predicting that by April of 1989, 90% of all beds being manufactured would comply with the voluntary guidelines. But that was in the context of years of steadily increasing conformance and the hope that conformance would continue to grow and that deaths and near-misses would begin to decline. But the conformance level never grew beyond the projection for 1989 and deaths and near-misses have not dropped.

xi. Even with the existing compliance rate, the Commission is contemplating the prospect of perhaps 50,000 nonconforming beds a year (or more) entering the marketplace, with many beds remaining in use for perhaps 20 years or longer. Under these circumstances, a 10% rate of noncompliance is too high.

xii. It is now clear that the bunk bed voluntary standard has not achieved an adequate reduction of the unreasonable risk of death to infants and children in a timely fashion, and it is unlikely to do so. Accordingly, the Commission finds that substantial compliance with the voluntary standard for bunk beds is unlikely.

xiii. Products that present some or all of the following factors might not be held to as strict a substantial compliance analysis. Those which:

- Rarely or never cause death;
- Cause only less severe injuries;
- Do not cause deaths or injuries principally to a vulnerable segment of the population;
- Are not intended for children and which have no special attraction for children;
- Have a relatively short life span;
- Are made by a few stable manufacturers or which can only be made by specialized manufacturers needing a significant manufacturing investment to produce the product;
- Are covered by a voluntary standard which continues to capture an increasing amount of noncomplying products; or
- Require some additional intervening action to be hazardous.

xiv. And, in analyzing some other product, there could be other factors that would have to be taken into consideration in determining what level of compliance is adequate to protect the public. The tolerance for nonconformance levels has to bear some relationship to the magnitude and manageability of the hazard addressed.

xv. The Commission emphasizes that its decision is not based on the argument that a

mandatory rule provides more powerful enforcement tools. If this were sufficient rationale, mandatory rules could always displace voluntary standards, and this clearly was not Congress's intent. But, with a mandatory standard, the necessity of complying with a mandatory federal regulation will be understandable to small manufacturers. State and local governments will have no doubt about their ability to help us in our efforts to locate these manufacturers.

C. The benefits expected from the rule bear a reasonable relationship to its costs.

1. *Bunk beds that do not comply with ASTM's requirements for guardrails.* The cost of providing a second guardrail for bunk beds that do not have one is expected to be from \$15–40 per otherwise noncomplying bed. If, as expected, the standard prevents virtually all of the deaths it addresses, the present value of the benefits of this modification are estimated to be from \$175–350 per otherwise noncomplying bed. Thus, the benefit of this provision is about 4–23 times its cost.

2. *Bunk beds that comply with ASTM's requirements for guardrails.* The voluntary standard allows up to a 15-inch gap in the coverage of the guardrail on the wall side of the upper bunk. Additional entrapment deaths are addressed by requiring that the wall-side guardrail be continuous from one end of the bed to the other. The estimated present value of the benefits of this requirement will be \$2.40 to \$3.50 per otherwise noncomplying bed. The Commission estimates that the materials cost to extend one guardrail an additional 30 inches (760 mm) will be less than the present value of the benefits of making the change. Further, the costs of any design changes can be amortized over the number of bunk beds produced after the design change is made. Thus, any design costs are nominal.

3. *Lower bunk end structures.* The Commission is aware of a death, involving entrapment in the end structures of the lower bunk, occurring in a scenario not currently addressed by the voluntary standard. This death is addressed by extending the upper limit of the voluntary standard's lower bunk end structures entrapment provisions from 9 inches above the lower bunk's sleeping surface to the bottom of the upper bunk and by also including a test for neck entrapment in this area. The Commission expects the costs of this requirement to be design-related only, and small. Indeed, for some bunk beds, material costs may decrease since less

material may be required to comply with these requirements than are currently being used. Again, the design costs for these modifications to the end structures can be amortized over the subsequent production run of the bed.

4. *Effect on market.* The small additional costs from any wall-side guardrail and end-structure modifications are not expected to affect the market for bunk beds, either alone or added to the costs of compliance to ASTM's provisions.

5. *Conclusion.* The Commission has no reason to conclude that any of the standard's requirements have costs that exceed the requirement's expected benefits. Further, the total effect of the rule is that the benefits of the rule will exceed its costs by about 4–23 times. Accordingly, the Commission concludes that the benefits expected from the rule will bear a reasonable relationship to its costs.

D. *The rule imposes the least burdensome requirement that prevents or adequately reduces the risk of injury for which the rule is being promulgated.* 1. The Commission considered relying on the voluntary standard, either alone or combined with a third-party certification program. However, the Commission concludes that a mandatory program will be more effective in reducing these deaths, each of which is caused by an unreasonable risk of entrapment. Accordingly, these alternatives would not prevent or adequately reduce the risk of injury for which the rule is being promulgated.

2. The Commission also considered a suggestion that bunk beds that conformed to the voluntary standard be so labeled. Consumers could then compare conforming and nonconforming beds at the point of purchase and make their purchase decisions with this safety information in mind. This, however, would not necessarily reduce injuries, because consumers likely would not know there is a voluntary standard and thus would not see any risk in purchasing a bed that was not labeled as conforming to the standard.

Dated: December 13, 1999.

Sayde E. Dunn,

Secretary, Consumer Product Safety Commission.

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