



UNITED STATES
 CONSUMER PRODUCT SAFETY COMMISSION
 4330 EAST WEST HIGHWAY
 BETHESDA, MD 20814

**BP - Toddler Beds -
 Notice of Proposed Rulemaking (NPR)**
 The contents of this document will be
 discussed at the Open Commission Meeting
 on Wednesday, March 10, 2010

VOTE SHEET

DATE: March 3, 2010

TO: The Commission
 Todd A. Stevenson, Secretary

THROUGH: Maruta Budetti, Executive Director
 Cheryl A. Falvey, General Counsel *CAF*
 Philip L. Chao, Assistant General Counsel *PLC*

FROM: Harleigh P. Ewell, Attorney, GCRA *HE*

SUBJECT: Notice of Proposed Rulemaking for Toddler Beds under Section 104(b) of the
 Consumer Product Safety Improvement Act of 2008

Section 104(b) of the Consumer Product Safety Improvement Act (“CPSIA”) directs the Commission to issue safety standards for durable infant or toddler products. Attached is a draft notice of proposed rulemaking (“NPR”) proposing a rule under section 104(b) of the CPSIA for toddler beds. The draft proposed rule is largely the same as the applicable voluntary standard, ASTM F 1821-09, with certain modifications. Also attached is a draft NPR for your consideration.

Please indicate your vote on the following options.

- I. Approve publication of the draft NPR proposing a standard for toddler beds in the *Federal Register* without change.

 (Signature)

 (Date)

CLEARED FOR PUBLIC RELEASE
 UNDER CPSA 6(b)(1)

THIS DOCUMENT HAS NOT BEEN
 REVIEWED OR ACCEPTED BY THE
 COMMISSION.

II. Do not approve publication of the draft NPR proposing a standard for toddler beds in the *Federal Register*.

(Signature)

(Date)

III. Publish the draft NPR proposing a standard for toddler beds in the *Federal Register* with changes.

(Please specify.)

(Signature)

(Date)

IV. Other.

(Please specify.)

(Signature)

(Date)

Attachment: Draft *Federal Register* Notice



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

This document has been electronically
approved and signed.

Memorandum

MAR - 3 2010

TO: The Commission
Todd A. Stevenson, Secretary

THROUGH: Cheryl A. Falvey, General Counsel
Maruta Z. Budetti, Executive Director

FROM: Robert J. Howell, Assistant Executive Director
Office of Hazard Identification and Reduction
Celestine T. Kiss, Project Manager
Division of Human Factors, Directorate for Engineering Sciences

SUBJECT: Staff's Draft Proposed Rule for Toddler Beds

I. INTRODUCTION

Section 104 of the Consumer Product Safety Improvement Act (CPSIA), *Standards and Consumer Registration of Durable Nursery Products*, requires the U.S. Consumer Product Safety Commission (CPSC, or Commission) to study and develop safety standards for certain infant and toddler products. Toddler beds are one of the products specifically identified in section 104(f)(2) of the CPSIA as a durable infant or toddler product.. The Commission is charged with promulgating consumer product safety standards that are substantially the same as the voluntary standards for toddler beds or more stringent than the voluntary standard if the Commission determines that more stringent standards would further reduce the risk of injury associated with toddler beds.

Section 104 of the CPSIA also requires the Commission to consult with representatives of consumer groups, juvenile product manufacturers, and independent child product engineers and experts to examine and assess the effectiveness of the voluntary standards. This consultation process commenced in October 2009 during the ASTM International (formerly known as the American Society for Testing and Materials) subcommittee meeting regarding the ASTM toddler bed voluntary standard, in which CPSC staff participated. Consultations with members of the ASTM subcommittee, who represent producers, users, consumers, government and academia¹, are ongoing.

This briefing package assesses the effectiveness of the toddler bed voluntary standard and presents staff's draft proposed rule to address potential hazards for Commission consideration.

¹ ASTM International website: www.astm.org, About ASTM International.

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REVIEWED OR ACCEPTED BY THE
COMMISSION.

II. BACKGROUND

A. *ASTM Voluntary Standard Overview*

ASTM F 1821 *Standard Consumer Safety Specification for Toddler Beds* is the voluntary standard that was developed to address the identified hazard patterns associated with the use of toddler beds. The standard was first approved in 1997 and revised in 2003 and 2006. The current version, ASTM F 1821-09, was approved on April 1, 2009, and published in May 2009.

A toddler bed is defined in the ASTM voluntary standard as any bed sized to accommodate a full-size crib mattress having minimum dimensions of 51 5/8 inches (1310 mm) in length and 27 1/4 inches (690 mm) in width and is intended to provide free access and egress to a child not less than 15 months of age and who weighs no more than 50 pounds (22.7 kg). The standard was developed in response to incident data supplied by the CPSC in an attempt to minimize the following hazards: entrapment in bed end structures, entrapment between the guardrail and side rail, and entrapment in the mattress support system. It also addresses corner post extensions, which may catch cords, ribbons, necklaces or clothing.

The ASTM standard contains general and performance requirements that pertain to the following (the numbers in the parentheses refer to the section of the current ASTM F 1821-09 standard):

- Hazardous Sharp Edges or Points (5.2),
- Small Parts (5.3),
- Lead in Paints (5.4),
- Wood Parts (5.5),
- Scissoring, Shearing or Pinching (5.6),
- Protective Components (5.7),
- Openings (5.8),
- Labeling (5.9 and 8.4),
- Corner Post Extensions (5.10),
- Mattress Retention (6.1),
- Mattress Support System (6.2),
- Mattress Support System Attachments to End Structures (6.3),
- Mattress Support System Openings (6.4),
- Guardrails (6.5),
- End Structures (6.6), and
- Partially Bounded Openings (6.7).

B. *Juvenile Products Manufacturers Association (JPMA) Certification*

The Juvenile Products Manufacturers Association (JPMA) has a certification program for a variety of juvenile products, including toddler beds. To obtain JPMA certification, manufacturers submit their products to an independent test laboratory for conformance testing to the most current ASTM voluntary standard. Currently, there are five manufacturers that sell JPMA certified toddler beds. There are an additional 24 firms that have certification for convertible cribs. Convertible cribs when in the toddler bed configuration must meet the toddler bed standard.

III. DISCUSSION

A. *Incident Data (Tab A)*

CPSC staff from the Directorate for Epidemiology, Division of Hazard Analysis, analyzed incident and death data related to toddler beds from 2005 through 2008. Staff is aware of four fatalities and 81 non-fatal incidents (with and without injuries) related to toddler beds. Of the four fatalities, two resulted from entrapments. The first death was the result of a six-month-old infant getting entrapped in the footboard while sleeping on a toddler bed. The second death involved a 13-month-old getting entrapped in the side rail of a flipped-over toddler bed while playing with an older sibling. Although coded as a toddler bed in the CPSC databases, the bed involved in the third death was not a toddler bed as defined in the ASTM standard. The incident was an asphyxiation death suffered by a ten-month-old who was napping in an inflatable children's bed. The last fatality was not related to the toddler bed structure; it was a strangulation death of a three-year-old on the cord of mini blinds located over his toddler bed. It is notable here that three of the four reported fatalities involved victims under the recommended age of 15 months in the current ASTM voluntary standard.

Twenty-six of the 81 (32%) non-fatal incidents involved an injury to a child on a toddler bed. Three of the injuries were fractures of limbs. The vast majority of the injuries were bumps and bruises. Sprains, scrapes, and lacerations were some of the other reported injuries associated with toddler beds.

Listed below is a classification of the hazard patterns identified among the non-fatal incident reports:

- Entrapment was the most commonly reported hazard. Approximately 31 percent of the incidents involved entrapment of a limb. The associated injuries, if any, ranged from fractures to sprains to bruises. More serious, potentially fatal entrapments of head or body in the side rails, in the mesh covering of the side rails, or between the mattress-support rails were reported in 14 percent of the incidents.
- Broken, loose, or detached components of the bed, such as the guardrail, hardware, or other accessories, were the next most commonly reported problems. However, only two injuries – one laceration and one ingestion – resulted from these problems.
- Product integrity issues, mostly integrity of the mattress support, were the next most commonly encountered hazard. These often resulted in the collapse of the bed causing the child to fall through.

- Inadequate mattress fit issues were the next most common hazard. A few children suffered sprains and broken limbs from getting caught in the gap between the mattress and the bed frame.
- Finally, there were some complaints of paint/coating issues, bed height/clearance issues, and inadequacy of guardrails, assembly instructions, and recalls.

Among the non-fatal incidents that reported age (67 out of 81), ages of the victims ranged between 11 months to six years. Nearly 66 percent of these incidents reported the age to be between 15 and 24 months. About 16 percent of the incidents involved children less than 15 months of age. However, it was not always clear that the reported age pertained to the child who was the regular user of the toddler bed. Furthermore, three of the 81 non-fatal incident reports involved inflatable children's beds, which do not conform to the ASTM definition of toddler beds. However, in the CPSC databases they were coded under toddler beds.

There were an estimated total of 1,380 injuries related to toddler beds that were treated in U.S. hospital emergency departments over the four-year period 2005-2008.

For the emergency department treated injuries related to toddler beds, the following characteristics occurred most frequently:

- Hazard – falls out of the toddler bed to a lower level (87%).
- Injured body part – head (30%) and face (24%).
- Injury type – lacerations (26%) and contusions/abrasions (20%).
- Disposition – treated and released (nearly 100%).

B. Assessment of ASTM F1821-09 (Tab B)

Based on its review of the current voluntary standard and the incidents involving toddler beds, CPSC staff believes that the requirements in the voluntary standard are not adequate to address some of the known hazards and that more stringent requirements would further reduce the risk of injury associated with toddler beds. Therefore, staff is recommending four changes to ASTM F 1821-09 in its draft proposed rule.

1. Guardrail Height

To reduce the number of falls from toddler beds, staff proposed a new guardrail height requirement that the guardrail extend at least 5 inches above the top of the bed's mattress. ASTM's *Standard Consumer Safety Specification for Bunk Beds (F 1427-07)* and *Standard Consumer Safety Specification for Portable Bed Rails (F 2085-09)* include this requirement as well.

2. Structural Integrity of Guardrails

Materials used for guardrails include metal, plastic, and wood. CPSC staff is aware of incidents in which bed rail joints of all three materials reportedly failed under normal use scenarios. For

example, a wooden guardrail repeatedly detached from the bed's end rail when the child climbed in and out of bed. The plastic hinges on another guardrail broke during assembly and would no longer lock in place during use.

CPSC staff recommends a new performance requirement and associated test method to address incidents related to guardrail structural issues. The performance requirement and test method recommended were adapted from the ASTM voluntary standard for *Portable Bed Rails (F2085-09)*. The portable bed rail requirement was developed to address incidents similar to those seen on toddler bed guardrails. For toddler beds, staff increase the force applied in the test from 40 to 50 pounds (lbs.) to represent the maximum recommended user's weight for a toddler bed.

The test requires gradually applying a 50lb. force at the uppermost horizontal part of the guardrail in a direction perpendicular to the plane of the rail. The force should be applied in the center along the length of the rail and then repeated with the force applied directly over each of the outermost legs of the guardrail. The force should be applied in the direction away from the mattress within a period of 5 seconds and maintained for an additional 10 seconds. This is intended to test the security of the rail to the bed. After testing, there shall be no hazardous conditions created as defined in Section 5 of the standard. The 50 lb. force was chosen for this test because the maximum weight of the intended user is 50 lbs.

3. Slat/Spindle Strength for Guardrails, Side Rails, and End Structures

Staff recommends a new performance requirement and associated test method for slat/spindle strength of guardrails, side rails, and end structures when permanently attached to the bed. This will test both the integrity of the slat joint and the slat material. This performance requirement is based on recent CPSC staff tests of cribs and toddler beds involved in slat breakage incidents.

Due to the variability in construction materials, staff recommends that *all* slats/spindles on the guardrails, side rails, or end structures of toddler beds that contain wooden or metal slats/spindles meet the new performance requirements. CPSC Division of Mechanical Engineering (ESME) staff conducted in-house testing of crib slats/spindles to identify the best weight required to test the slats/spindles without compromising crib integrity. A total of 96 slats were tested to failure on 18 different incident beds. The 18 incident beds tested consisted of four different manufacturers and 12 different models.

There is very little anthropometric data available depicting the forces children can apply on a bed slat. Therefore, the goal of staff's testing was to discern what forces different slats from the same incident bed could withstand. It is feasible to infer the maximum force a bed occupant could apply to a bed slat by reviewing the minimum failure forces for each of the 18 incident beds. The minimum values range from 29 to 79 lbs. Therefore, assuming the minimum strength value for each bed is representative of the failure force exerted by the bed occupant, then setting the slat strength requirement at 80 lbs. would capture failures of known incident beds.

ESME staff conducted additional slat strength testing of a non-incident market entry crib; staff testing resulted in failure forces ranging from 85 to 124 lbs. The minimum slat failure of 85 lbs. force indicates that the minimum force required to break a slat may be greater than the force a

bed occupant is able to apply, since there have not been any incidents reported involving cribs in which the slats broke at this higher value. This data set supports setting the target slat strength requirement at 80 lbs.

Testing shall be conducted by gradually, over a period of not less than 2 seconds or greater than 5 seconds, applying an 80 lb. force at the midpoint, between the top and bottom of the slat/spindle being tested. The force shall be applied through a contact area large enough to not cause visible indentation or cutting of the slat/spindle, but not wider than 1 inch (2.54 cm) when measured parallel to the longitudinal axis of the slat/spindle. This weight shall be maintained for 30 seconds. The 80 lb. force shall be used on 25 percent of the slats. Slats/spindles that offer the least resistance to bending based upon their geometry shall be selected to be tested within this grouping of 25 percent, except that adjacent slats/spindles shall not be tested. The remaining slats shall be tested with a 60 lb. force.

After testing in accordance with the procedure for the 80 lb. force and the 60 lb. force there shall be no slat/spindle breakage or separation of a slat/spindle from the guardrails, side rails, or end structures. If any slat fails, the product fails the test. End vertical rails that are joined between the slat assembly top and bottom rails are not considered slats and do not require testing to this procedure.

4. Warning Statements

CPSC Human Factors staff believes that the warnings section of the current ASTM standard is confusing as it is currently organized, with explicit warning language for only certain information, “additional” warning statements that leave the applicable hazards open to interpretation, and redundancies between these two sets of required warning information. In addition, the warning label specified in section 8.4.3 of the current standard merges two distinct hazards into a single label, making it difficult to tell what warning information is associated with each hazard. To address these issues, the Human Factors staff suggests that all of the required warnings specified in section 8.4 be presented as two separate warnings—one addressing the entrapment hazard and the other addressing the strangulation hazard. Below is a brief explanation for the changes in the label. For more explicit details of the changes refer to the Human Factors’ memo at Tab C.

Entrapment Warnings

ASTM F 1821–09 specifies differing warning requirements for toddler beds depending upon whether the beds employ a guardrail as the mattress containment means. Specifically, section 8.4.4.2 of the standard states that toddler beds that employ such a guardrail shall include—unless the guardrail cannot be removed by the consumer—a warning statement telling consumers that the guardrail must be used to avoid the formation of a gap between the mattress and the bed that could cause entrapment. The CPSC staff believes, however, that such a warning statement would not be needed for toddler beds that do not present an entrapment hazard with the guardrail removed. With this in mind, the Human Factors staff proposes two alternative entrapment-related warnings: one for toddler beds that would not meet the performance requirements of the standard with the guardrail removed and one for all other toddler beds.

- Entrapment warning for toddler beds that do not meet the performance requirements of the standard with the guardrail removed:

⚠ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.
NEVER use bed with children younger than 15 months.
ALWAYS use supplied guardrails to avoid gaps between mattress and bed.
ONLY use full-size crib mattress of the recommended size.
ALWAYS follow assembly instructions.

- Entrapment warning for toddler beds without removable guardrails or that will meet the requirements of the standard with the guardrails removed:

⚠ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.
NEVER use bed with children younger than 15 months.
ONLY use full-size crib mattress of the recommended size.
ALWAYS follow assembly instructions.

To the staff's knowledge, the minimum age recommendation of 15 months for toddler beds is based largely on the entrapment potential for children younger than this. Thus, the statement that "[i]nfants have died in toddler beds from entrapment and strangulation," which appears in the original warning, has been carried over with slight revisions to the staff's proposed warning as, "Infants have died in toddler beds from entrapment." Given that this statement already explicitly references "entrapment," the staff believes that including an initial "ENTRAPMENT HAZARD" statement would introduce unnecessary redundancy. Furthermore, omitting this statement from the warning allows one to place greater emphasis on the consequences of the hazard—that is, death—and the subpopulation most at risk of dying from exposure to the hazard by (1) moving the statement, "Infants have died in toddler beds from entrapment," toward the beginning of the warning message and (2) reformatting this statement in all-uppercase, boldface type. The ASTM F 1821 subcommittee has pointed out that there continue to be incidents with toddler beds involving children younger than the intended age for these products, so emphasizing the at-risk population is important. In addition, warnings and persuasion research has found that perceived threat plays a significant role in determining whether one complies with a warning (Cameron & DeJoy, 2006; Riley, 2006), so emphasizing the potential for death would tend to increase the efficacy of a warning.

Explicit hazard information in a warning has been found to lead to higher levels of perceived hazardousness and greater intent to comply with the warning (Laughery & Paige Smith, 2006). The original warning message did not specify the source of entrapment or how entrapment might lead to death, and it is unclear whether many consumers could readily and correctly infer this information. The sentence, "Openings in and between bed parts can entrap head and neck of a small child," is intended to remedy this situation by providing a more explicit description of the mechanism that creates the hazard.

Section 8.4.4.1 of the current ASTM standard states that additional warning statements shall address the minimum mattress size. The language of this section implies that the precise mattress dimensions should be provided, both in English and metric units. Section 8.3.2, however, already specifies that both the bed and its retail carton shall be clearly and legibly marked with the intended mattress for the bed, including the precise dimensions in both English and metric units. The Human Factors staff, therefore, believes that repeating precise dimensions within the warning is unnecessary and may add sufficient length to the warning to discourage some consumers from reading it. The staff instead proposes that the warning include a statement such as, “ONLY use full-size crib mattress of the recommended size.”

Strangulation Warning

To address the strangulation hazard, the Human Factors staff proposes the following warning for all toddler beds:

WARNING

STRANGULATION HAZARD

NEVER place bed near windows where cords from blinds or drapes may strangle a child.
NEVER suspend strings over bed.
NEVER place items with a string, cord, or ribbon, such as hood strings or pacifier cords, around a child's neck. These items may catch on bed parts.

Like the proposed entrapment warning labels, this warning is consistent with the type-size requirements described in the current ASTM standard and the safety alert symbol design is consistent with ANSI Z535.4–2007, *American National Standard for Product Safety Signs and Labels*. This warning largely reflects all of the hazard-relevant information required in the original warnings. The staff does believe, however, that the warning statement about not placing items with a string, cord, or ribbon around a child's neck would be more effective with the clarifying sentence, “These items may catch on bed parts.” Without this sentence, consumers may find it difficult to infer how the presence of a cord around a child's neck is relevant to the toddler bed or how the cord and bed interact to create the potential for strangulation.

C. Potential Small Business Impact

Toddler beds and convertible cribs are typically produced and/or marketed by juvenile product manufacturers and distributors or by furniture manufacturers and distributors, some of which have separate divisions for juvenile products. There are currently at least 73 firms known manufacturers or importers supplying toddler beds and/or convertible cribs to the U.S. market. Approximately 48 suppliers are domestic manufacturers (66%), 13 are domestic importers (18%), 11 are foreign manufacturers (15%), and the remaining firm is a foreign supplier who imports from other countries and exports to the United States. Based on Small Business Administration definitions, there are 52 small firms—41 small domestic manufacturers and 11 small domestic importers—likely to be affected by the proposed standard, as described in the Directorate for Economic Analysis memo (Tab D).

It is possible that the proposed standard could have a significant impact on a substantial number of small entities. The Juvenile Products Manufacturers Association (JPMA), the major U.S. trade association that represents juvenile product manufacturers and importers, runs a voluntary Certification Program for several juvenile products. Approximately 40 percent of firms supplying toddler beds and/or convertible cribs to the U.S. market are JPMA-certified as compliant with the current ASTM voluntary standard (29 firms). Of the small domestic businesses, 32 percent of manufacturers (13 of 41 firms) and 55 percent of importers (6 of 11 firms) are JPMA-certified as ASTM compliant. Additionally, there are two small manufacturers that claim compliance with the ASTM standard that are not part of the JPMA Certification Program. Firms supplying products already compliant with the voluntary standard may not need to make any product modifications to meet the proposed standard. However, some of these firms and all firms supplying products that do not comply with the voluntary standard will need to make at least some modifications to their toddler beds and convertible cribs to comply with the recommended standard. The extent of these costs is unknown, but since product redevelopment would likely be necessary in many cases, it is possible that the costs could be large and have the potential to reduce firms' ability to compete with substitute products.²

A few small businesses have product lines consisting entirely or primarily of toddler beds, convertible cribs, and related products (such as accompanying furniture).³ These firms may be disproportionately affected by any proposed standard. If the cost of developing (or importing) a compliant product proves to be a barrier for these firms, the loss of toddler beds and convertible cribs as a product category could be significant and may not be easily mitigated by the sale of other juvenile products.

IV. STAFF RECOMMENDATIONS

The requirements outlined in the staff's draft proposed rule are substantially the same as those in ASTM F 1821-09, *Standard Consumer Safety Specification for Toddler Beds*, with the following modifications:

1. A height requirement for guardrails.
2. New performance requirement and associated test method to address incidents related to guardrail structural issues.
3. New performance requirement and associated test method for slat/spindle strength of guardrails, side rails, and end structures.
4. New separate warning labels to address entrapment and strangulation hazards.

² Even if *all* the small firms that are JPMA-certified as compliant with ASTM's voluntary standard did not require any additional changes to comply with the proposed standard, there would still be 58 percent (30 out of 52 firms) that would probably need to undergo product redevelopment to comply. This would typically need to be done for multiple products. To the extent that some of the products not certified by JPMA may still comply, the impact will be reduced.

³ There are five firms that seem to be entirely dependent on these products as the core of their product lines with an additional fourteen firms that are primarily dependent upon these products. For the latter, however, it should be noted that a few firms also produce some non-convertible cribs and therefore may be able to adjust their product lines to use exclusively non-convertible cribs.

It is possible that the staff's draft proposed rule could have a significant impact on a substantial number of small entities. All firms supplying products that do not comply with the voluntary standard will need to make at least some modifications to their toddler beds and convertible cribs to comply with the staff's draft recommended rule, as will some firms who are compliant with the current voluntary standard. The extent of these costs is unknown, but since product redevelopment would likely be necessary in many cases, it is possible that the costs could be large and have the potential to reduce firms' ability to compete with substitute products.

CPSC staff recommends that the Commission proceed with the rulemaking process for toddler beds by publishing a Notice of Proposed Rulemaking as drafted by the Office of General Counsel and submitted separately from this briefing package. CPSC staff also recommends an effective date of six months after publication of the final rule.

TAB A



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Memorandum

Date: January 28, 2010

TO : Celestine T. Kiss
Division of Human Factors
Directorate for Engineering Sciences

THROUGH: Russell H. Roegner, Ph.D.
Associate Executive Director
Directorate for Epidemiology

Kathleen Stralka
Director, Division of Hazard Analysis
Directorate for Epidemiology

FROM : Risana T. Chowdhury
Division of Hazard Analysis

SUBJECT : Toddler Beds-Related Deaths, Injuries and Potential Injuries, and NEISS Injury
Estimates; 2005 – Present

Introduction

This memorandum characterizes the number of deaths and injuries and the types of hazards coded as toddler beds (product code 4082) over a period of four and a half years beginning in 2005⁴. These characterizations are based on reports received by CPSC staff. A toddler bed is defined in the ASTM voluntary standard [F1821-09] as any bed sized to accommodate a full-size crib mattress having minimum dimensions of 51 5/8 inches in length and 27 1/4 inches in width and is intended to provide free access and egress to a child not less than 15 months of age and who weighs no more than 50 pounds. CPSC databases did not have a dedicated product code for identifying toddler beds prior to 2005. As such, the data analyzed in this memo begins with the year 2005. The estimated number of emergency department treated injuries associated with toddler beds from 2005-2008 is also presented.

⁴ Not all of these incidents are addressable by an action the CPSC could take; however, it was not the purpose of this memorandum to evaluate the addressability of the incidents, but rather to quantify the number of fatalities and injuries reported to CPSC staff and to update estimates of emergency department treated injuries.

*Incident Data*⁵

CPSC staff is aware of four fatalities and 81 non-fatal incidents (with and without injuries) related to toddler beds that were reported to have occurred since 2005.

Fatalities

It is notable that three of the four reported fatalities involved victims under the recommended age of 15 months in the current ASTM voluntary standard. Of the four fatalities, two resulted from entrapments. The first death was the result of a six-month old infant getting entrapped in the footboard while sleeping on a toddler bed. The second death involved a 13-month old getting entrapped in the side rail of a flipped-over toddler bed while playing with an older sibling. Although coded as a toddler bed in the CPSC databases, the bed involved in the third death was not a toddler bed as defined in the ASTM standard. The incident was an asphyxiation death suffered by a ten-month old who was napping in an inflatable children's bed. The last fatality was not related to the toddler bed structure; it was a strangulation death of a three-year old on the cord of mini blinds located over his toddler bed.

Non-Fatal Incidents

Twenty-six of the 81 (32 percent) non-fatal incidents involved an injury to a child on a toddler bed. Three of the injuries were fractures of limbs. The vast majority of the injuries were bumps and bruises. Sprains, scrapes, and lacerations were some of the other reported injuries associated with toddler beds.

Listed below is a classification of the hazard patterns identified among the non-fatal incident reports:

- Entrapment was the most commonly reported hazard. Approximately 31 percent of the incidents involved entrapment of a limb. The associated injuries, if any, ranged from fractures to sprains to bruises. More serious, potentially fatal entrapments of head or body in the side rails, in the mesh covering of the side rails, or between the mattress-support rails were reported in 14 percent of the incidents.

⁵ The CPSC databases searched were the In-Depth Investigation (INDP) file, the Injury or Potential Injury Incident (IPII) file, and the Death Certificate (DTHS) file. These reported deaths and incidents are neither a complete count of all that occurred during this time period nor a sample of known probability of selection. However, they do provide a minimum number of deaths and incidents occurring during this time period and illustrate the circumstances involved in the incidents related to toddler beds.

Date of extraction for reported incident data was 06/23/09. All data coded under product code 4082 was extracted. Upon careful joint review with ES staff, some cases were considered out-of-scope for the purposes of this memo. For example, a child was reported to have begun epileptic seizures when she started using a toddler bed. Another example included a report of an unspecified children's bed, which other supporting documents showed to be a twin bed. These records were excluded.

- Broken, loose, or detached components of the bed, such as the guard rail, hardware, or other accessories, were the next most commonly reported problems. However, only two injuries - one laceration and one ingestion - resulted from these problems.
- Product integrity issues, mostly integrity of the mattress-support, were the next most commonly encountered hazard. These often resulted in the collapse of the bed causing the child to fall through.
- Inadequate mattress fit issues were the next common hazard. A few children suffered sprains and broken limbs from getting caught in the gap between the mattress and the bed frame.
- Finally, there were some complaints of paint/coating issues, bed height/clearance issues, and inadequacy of guard rails, assembly instructions, and recalls.

Among the non-fatal incidents that reported age (67 out of 81), age ranged between 11 months to six years. Nearly 66 percent of these incidents reported the age to be between 15 and 24 months. About 16 percent of the incidents involved children less than 15 months of age. However, it was not always clear that the reported age pertained to the child who was the regular user of the toddler bed. Furthermore, three of the 81 non-fatal incident reports involved inflatable children's beds, which do not conform to the ASTM definition of toddler beds. However, in the CPSC databases they were coded under toddler beds.

National Injury Estimates⁶

There were an estimated total of 1,380 injuries (sample size=55, coefficient of variation=0.21) related to toddler beds that were treated in U.S. hospital emergency departments over the four-year period 2005-2008. The injury estimates for individual years are not reportable since they fail to meet publication criteria⁷. There was no statistically significant increase or decrease observed in the estimated injuries from one year to the next, nor was there any statistically significant trend observed over the 2005-2008 period.

No deaths were reported through the NEISS. For the emergency department-treated injuries related to toddler beds, the following characteristics occurred most frequently:

- Hazard – falls out of the toddler bed to a lower level (87%).
- Injured body part – head (30%) and face (24%).

⁶ The source of the injury estimates is the National Electronic Injury Surveillance System (NEISS), a statistically valid injury surveillance system. NEISS injury data are gathered from emergency departments of hospitals selected as a probability sample of all the U.S. hospitals with emergency departments. The surveillance data gathered from the sample hospitals enable the CPSC staff to make timely national estimates of the number of injuries associated with specific consumer products.

All data coded under product code 4082 was extracted. Upon careful joint review with ES staff, certain records were considered out-of-scope for the purposes of this memo. For example, a child was injured by a whiffle ball which was stuck to his finger while he was in a toddler bed. Another example was a reported injury that an adult suffered while moving a toddler bed. These records were excluded prior to deriving the statistical injury estimates.

⁷ According to the NEISS publication criteria, an estimate must be 1,200 or greater, the sample size must be 20 or greater, and the coefficient of variation must be 33% or smaller.

- Injury type – lacerations (26%) and contusions/abrasions (20%).
- Disposition – treated and released (nearly 100%).

The age of patients in these injuries ranged between four months and six years, with nearly 59 percent between 15 months and two years. About 16 percent of the patients were reported to be less than 15 months in age. As in the case of non-fatal reported incidents, it was not always clear if the patient injured was the usual user of the toddler bed.

TAB B



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Memorandum

Date: February 23, 2010

TO: Celestine T. Kiss, Project Manager
Division of Human Factors
Directorate for Engineering Sciences

THROUGH: Erlinda M. Edwards
Acting Associate Executive Director
Directorate for Engineering Sciences

Mark Kumagai, Director
Division of Mechanical Engineering
Directorate for Engineering Sciences

FROM: Jacob J. Miller
Division of Mechanical Engineering
Directorate for Engineering Sciences

SUBJECT : Proposed Changes to ASTM F 1821-09, Standard Consumer Safety Specification for Toddler Beds, for Incorporation in Staff's Draft Proposed Rule.

I BACKGROUND / OVERVIEW

Section 104 of the Consumer Product Safety Improvement Act (CPSIA), *Standards and Consumer Registration of Durable Nursery Products*, requires the U.S. Consumer Product Safety Commission (CPSC) to assess the effectiveness of voluntary consumer product safety standards for durable infant and toddler products and to promulgate mandatory safety standards. Section 104 (b)(1)(B) states that "The Commission shall...promulgate consumer product safety standards that -- (i) are substantially the same as voluntary standards; or (ii) are more stringent than such voluntary standards if the Commission determines that more stringent standards would further reduce the risk of injury associated with such products."

The ASTM voluntary standard for toddler beds, ASTM F 1821, was originally approved in 1997. The 1997 version of the standard included test requirements to protect against removal of protected components, scissoring, shearing, pinching, finger entrapment, torso entrapment (limited to guardrails and end structures), and compromise of the bed's structural components. In 2006, ASTM added test requirements to protect against strangulation and entrapment hazards created from corner post extensions and partially bounded openings. Lastly, in 2009, ASTM added provisions to reduce entrapment hazards by testing for hazardous openings, not only in the bed's guardrails and end structures, but also in the entire mattress support system, including the

headboard, footboard, and any point where these components could be joined together. This memorandum assesses the effectiveness of ASTM F 1821-09 *Standard Consumer Safety Specification for Toddler Beds* and recommends changes to that standard for inclusion in the staff's draft proposed rule on toddler beds.

A) Incident Data Review

According to CPSC's Directorate for Epidemiology staff, there were four fatalities and 81 non-fatal incidents (with and without injuries) reported to have occurred since 2005⁸. Two of the four fatalities resulted from entrapments. The first death was the result of a six-month-old infant getting entrapped in the footboard while sleeping on a toddler bed. The second death involved a 13-month-old getting entrapped in the side rail of a flipped-over toddler bed while playing with an older sibling. The third death involved asphyxia of a 10-month-old on an inflatable children's bed being used as a toddler bed. The fourth death involved strangulation with a mini-blind cord while the three-year-old victim was on a toddler bed. It should be noted that three of the four deaths occurred to children who were younger than the intended age range for these products, which is not less than 15 months.

Entrapment was the most common hazard reported among the non-fatal incidents. Of the total incidents reported through INDP, IPII, and the DTHS files, approximately 31 percent involved entrapment of a limb. The associated injuries ranged from fractures to sprains to bruises. A few children suffered sprains and broken limbs from getting caught in the side/guard rails, head and foot boards, or the gap between the mattress and the bed frame. More serious, potentially fatal entrapments of the head or body in the side rails or between the mattress-support rails were reported in 14 percent of the incidents.

Broken, loose, or detached components of the bed, such as the guardrails, rail slats, and other components, were the second most common non-fatal reported hazard. The most common structural integrity issue not addressed by the current ASTM standard was structural failure of guard/side rails due to rail detachment, joint fracture or separation, and broken and/or loose slats. Many of these incidents created a fall hazard.

Of the total 1380 estimated injuries from NEISS⁹ from 2005 to 2008, 87 percent involved a child falling out of a toddler bed to a lower level. Injuries sustained included lacerations, contusions, and abrasions to the head and/or face.

Falls, entrapment, and structural integrity issues have been reported in the majority of incidents. Therefore, the following proposed requirements in Section II aim at reducing fatalities and injuries related to these types of hazards.

⁸ The CPSC databases searched were the In-Depth Investigation (INDP) file, the Injury or Potential Injury Incident (IPII) file, and the Death Certificate (DTHS) file. Date of extraction for reported incident data was 06/23/09.

⁹ The source of injury estimates is the National Electronic Injury Surveillance System (NEISS), an injury surveillance system from a probability based sample of U.S. hospital emergency departments.

B) Adequacy of ASTM F 1821-09

The 2006 revision of ASTM F1821 added test requirements to identify partially bounded openings above the level of the mattress support system. The 2009 revision improved on this performance requirement to add a torso entrapment test to identify openings, not only in the guardrails and end structures, but also in the mattress support system. This 2009 revision directly addresses the two entrapment deaths and the multiple torso entrapment incidents reported. However, due to the incidents reported regarding component failure of the guard/side rails, and the potential for entrapment, staff recommends additional testing requirements in the staff's draft proposed rule.

II PROPOSED REQUIREMENTS FOR TODDLER BEDS

Directorate for Engineering Sciences, Division of Mechanical Engineering (ESME) staff recommends adding requirements to the staff's draft proposed rule relating to:

- Guardrail Height
- Guardrail Structural Integrity
- Slat/Spindle Strength

Guardrail Height

To reduce the number of falls from toddler beds, staff proposes a new guardrail height requirement that the guardrail extend at least 5 inches above the top of the bed's mattress. The ASTM voluntary standards for both *Bunk Beds (F 1427-07)* and *Portable Bed Rails (F 2085-09)* include this requirement.

Guardrail Structural Integrity

Materials used for guardrails include metal, plastic, and wood. CPSC staff is aware of incidents in which bed rail joints of all three materials reportedly failed under normal use scenarios. For example, a wooden guardrail repeatedly detached from the bed's end rail when the child climbed in and out of bed. The plastic hinges on another guardrail broke during assembly and would no longer lock in place during use.

CPSC staff recommends a new performance requirement and associated test method to address incidents related to guardrail structural issues. The performance requirement and test method recommended were both adapted from the ASTM voluntary standard for portable bed rails (*F 2085-09, Standard Consumer Safety Specification for Portable Bed Rails*). The force applied in the test was increased from 40 to 50 lbs. to represent the maximum recommended user's weight for a toddler bed. The portable bed rail requirement was developed to address incidents similar to those seen on toddler bed guardrails.

Slat/Spindle Strength

Staff recommends a new performance requirement and associated test method for slat strength. This will test both the integrity of the slat joint and the slat material. This performance requirement is based on recent CPSC staff tests of cribs and toddler beds involved in slat breakage incidents and collected as samples for evaluation. The results of these tests are presented below.

CPSC Staff Testing

From late 2008 to early 2010, ESME staff performed slat strength tests on wood cribs and toddler beds involved in slat breakage incidents. Slat strength tests were conducted using the test method specified in the latest ASTM crib standard (*F 1169-09, Standard Specification for Full-Size Baby Crib*), except that the test load was increased until the slat or joint failed. A total of 96 slats were tested to failure on 18 different incident beds. The 18 incident beds tested consisted of four different manufacturers and 12 different models. Table 1 lists the failure forces for each of the incident cribs.

TABLE 1: Slat Strength Tests Results for Cribs Involved in Slat Failure Incidents

Bed No	Force to Failure (lbs.)	MIN (lbs.)	User's Age (months)
1	28.8, 45.3, 61.7, 67.3, 68.8, 69.2, 74.8, 93.7, 117	29	27
2	38, 39, 88	38	20
3	38.1, 60.9, 73.9, 100.5, 131	38	8
4	39, 50, 54, 55, 57	39	20
5	47, 83, 114	47	14
6	51, 60.2, 92, 111.8, 168.3	51	21
7	51.1, 54.7, 68.8, 70.1, 77.7, 82.8, 90.8, 100.8, 101	51	13
8	53.5, 60.9, 65.2, 68, 80.2	54	20
9	55.9, 83.8, 96, 112.8, 114	56	14
10	60.5, 60.6, 61.9, 79.5	61	8
11	62.7, 63.9, 65.9, 76.5, 83.4, 84.6, 93.3, 94.4, 100.1, 100.9, 101.3	63	21
12	63.1, 97.5, 100.4, 119.8, 121.3	63	5
13	67.1, 67.2, 70.3, 74.1, 82.4	67	16
14	67.5, 69.5, 81.3, 90.6, 92.1	68	15
15	72, 73, 74, 83	72	13
16	73.6, 92.6, 101.1, 109.9	74	8
17	78.8, 86.6, 100.7, 107.1, 208.1	79	9
18	78.8, 100.8, 101	79	28

There is very little anthropometric data available depicting the forces children can apply on a bed slat. Therefore, the goal of staff's testing was to discern what forces different slats from the same incident bed could withstand. It is feasible to infer the maximum

force a bed occupant ¹⁰ could apply to a bed slat by reviewing the minimum failure forces for each of the 18 incident beds. Table 1 lists in ascending order the minimum failure forces for each of the 18 beds. The minimum values range from 29 to 79 lbs. Therefore, assuming the minimum strength value for each bed is representative of the failure force exerted by the bed occupant, then setting the slat strength requirement at 80 lbs. would capture failures of known incident beds.

ESME staff conducted additional slat strength testing of a non-incident market entry crib; staff testing resulted in failure forces ranging from 85 to 124 lbs. (see Table 2). Table 2 includes slat strength results from two sample cribs of the same manufacturer and slat geometry. The minimum force of 85 lbs. required to cause slat failure indicates that the minimum force required to break a slat may be greater than the force a bed occupant is able to apply, since there have not been any incidents reported involving cribs in which the slats broke at this higher value. This data suggests setting the target slat strength requirement at 80 lbs.

TABLE 2: Slat Strength Tests Results of a Non-Incident Market Entry Crib

Slat No	Force to Failure (lbs.)
1	85
2	86
3	87
4	87
5	94
6	94
7	99
8	100
9	103.6
10	111.5
11	112.3
12	113
13	114
14	115
15	116
16	121.5
17	123.5

While conducting slat strength tests, ESME staff observed that testing adjacent slats significantly compromised the integrity of non-incident bed rails. This occurred even at the lower end of the spectrum of failure forces (e.g., 85 to 90 lb. range). Therefore, it is plausible to believe requiring all slats to be tested to 80 lbs. will have a similar result and would, therefore, be too stringent. Instead, staff is proposing testing 25 percent of the

¹⁰ In Table 1, the incident cribs involving a child 15 months old or older are highlighted. It is important to note fifteen months is the recommended minimum user's age for a toddler bed. It is also interesting to note that measurements presented in Table 1 do not suggest that exerted forces consistently increase with increasing age of the occupant.

slats to 80 lbs. and testing the remaining slats to 60 lbs. This reduction in force is intended to compensate for any damage to the bed rail caused by testing an adjacent slat to 80 lbs. The 60 lb. requirement also aligns fairly close with the 56.2 lb. slat strength requirement of both the current ASTM crib standard, ASTM F 1169-09, and the British crib standard, EN 716.

Other Points of Interest

The slat strength provisions in ASTM F 1169-09 require testing of only 25 percent of the total number of slats to 56.2 lbs. or 250 N. This requirement was adapted from the British crib standard, EN 716, balloted in early 2009 for inclusion in the ASTM standard, and added in December 2009. During that time several crib and toddler bed manufacturers¹¹ began in-house testing of bed slats to meet the new ASTM crib slat strength requirement of 56.2 lbs. In addition, several manufacturers stated they have increased in-house slat strength testing to 80 lbs., based on discussions with ESME staff regarding a possible future increase in slat strength to 80 lbs.

The ASTM working group for cribs is currently proposing a slat strength requirement of 80 lbs. Thus, a similar requirement for toddler beds would harmonize the slat strength requirements for cribs and toddler beds. This is important for consistency and clarity since many cribs are converted into toddler beds and because many toddler bed manufacturers also manufacture cribs.

Proposed Slat Strength Requirement

Based on recent slat strength tests results, variability in wood strength properties, and the significant foreseeable hazard a broken slat can create in a toddler bed, ESME staff recommends testing all slats/spindles – 25 percent at 80 lbs. and 75 percent at 60 lbs.

The staff’s proposed wording for each of its recommendations is given in Table 3.

TABLE 3: CPSC Staff Recommended Changes to ASTM F 1821-09, Standard Consumer Safety Specification for Toddler Beds

(Italics are commentary to help explain or provide a reference to the recommendation.)

ASTM F1821 Section #	Sub-Section	Recommended Addition
6.5 - Guardrails (Reformatting to Adjust for Recommended New General Requirement)		Guardrails
6.5.1 (New Numbering, Same Requirement)	6.5.1	<i>{same as F 1821 – 09 Standard Consumer Safety Specification for Toddler Beds sect 6.5}</i>

¹¹ Source: meeting log dated January 16, 2010 with crib and toddler bed manufacturers.

6.5.2 - Guardrail Height (Recommended New General Requirement)	6.5.2	The upper edge of the guardrails shall be at least 5 in. (130 mm) above the sleeping surface when a mattress of a thickness that is the maximum specified by the manufacturer's instructions is used. <i>{similar to ASTM F 1427-07 Standard Consumer Safety Specification for Bunk Beds sect 4.6.3}</i>
6.8 - Structural Integrity of Guardrails (Recommended New Performance Requirement)		After testing in accordance with 7.9, the guardrail shall not be broken or detached or create a condition that would present any of the hazards described in section 5. The guardrail also shall not be deformed or displaced so as to create a hazard addressed by the performance requirements of section 6. <i>{similar to ASTM F 2085-09 Standard Consumer Safety Specification for Portable Bed Rails sect 6.1}</i>
6.9 – Slat/Spindle Strength (Recommended New Performance Requirement)		Slat/Spindle Strength – Toddler beds that contain wooden or metal slats or spindles shall meet the performance requirements in section 6.9.1.
	6.9.1	After testing in accordance with the procedure in 7.10, there shall be no slat breakage or separation of a slat from the guardrails, side rails, or end structures.
7.9 - Test Method for Guardrail Structural Integrity (Recommended Test Method for New Requirement 6.8)		Firmly secure the toddler bed on a stationary flat surface using clamps. <i>{similar to F 2085-09 Standard Consumer Safety Specification for Portable Bed Rails sect 8.1.1}</i>
	7.9.1	Gradually apply a force of 50 lbf. (222.4 N) at the uppermost horizontal part of the guardrail in a direction perpendicular to the plane of the rail. The force should be applied in the center along the length of the rail and then repeated with the force applied directly over each of the outermost legs of the guardrail. The force should be applied in the direction away from the mattress within a period of 5 s and maintained for an additional 10 s. <i>{similar to F 2085-09 Standard Consumer Safety Specification for Portable Bed Rails sect 8.1.2 except the force applied was increased from 40 to 50 lbf.}</i>

7.10 - Test Method for Slat/Spindle Strength (Recommended Test Method for new Requirement 6.9)		Slat/Spindle Strength
	7.10.1	Slat/spindle static load test shall be performed with the slat/spindle assemblies removed from the bed and supported only on the rail corners through a contact area not more than 3 inches (7.6 cm) when measured from the end of the rail in a direction parallel to the longitudinal axis of the rail. Besides the corners, the upper and lower horizontal rails of both linear and contoured rails shall be free to deflect under the applied force.
	7.10.2	Gradually, over a period of not less than 2 s or greater than 5 s, apply 80 lbf. (355.9 N) to the midpoint, between the top and bottom of the slat/spindle being tested. This weight or force shall be applied through a contact area large enough to not cause visible indentation or cutting of the slat/spindle, but not wider than 1 inch (2.54 cm) when measured parallel to the longitudinal axis of the slat/spindle. This force shall be maintained for 30 s.
	7.10.3	Test, according to 7.10.2, 25% (rounding up to the nearest percentage, if necessary) of all slats/spindles. Slats/spindles that offer the least resistance to bending based upon their geometry shall be selected to be tested within this grouping of 25% except that adjacent slats/spindles shall not be tested per 7.10.2. Place an identifying mark on all tested spindles/slats.
	7.10.4	Upon completion of the tests described in 7.10.2 and 7.10.3, gradually apply, over a period of not less than 2 s or greater than 5 s, 60 lbf. (266.9N) at the midpoint, between the top and bottom of the spindles/slats not previously tested under 7.10.2 and 7.10.3. This weight or force shall be applied through a contact area large enough to not cause visible indentation or cutting of the slat/spindle, but not wider than 1 in. (2.54cm) when measured parallel to the longitudinal axis of the slat/spindle. This weight shall be maintained for 30 s.
	7.10.5	End vertical rails that are joined between the slat assembly top and bottom rails are not considered slats and do not require testing under 7.10.

III CONCLUSIONS

ESME staff recommends adopting the requirements specified in ASTM F 1821-09 as the mandatory standard for toddler beds including three additional requirements not currently in the ASTM standard. Staff recommends adding requirements for guardrail height, guardrail structural integrity, and slat/spindle strength. An established guardrail height and strength requirement will aid in reducing the number of falls and associated injuries. The more stringent slat/spindle strength test will better protect children from dangerous gaps created from broken slats.

TAB C –



UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

Memorandum

TO: Celestine T. Kiss, Project Manager,
Division of Human Factors, Directorate for Engineering Sciences

THROUGH: Erlinda M. Edwards, Acting Associate Executive Director,
Directorate for Engineering Sciences

Robert B. Ochsman, Ph.D., Director,
Division of Human Factors, Directorate for Engineering Sciences

FROM: Timothy P. Smith, Engineering Psychologist,
Division of Human Factors, Directorate for Engineering Sciences

SUBJECT: Warning Statements for Toddler Beds (CPSIA Section 104)

Background

Section 104(b) of the Consumer Product Safety Improvement Act of 2008 (CPSIA) requires the U.S. Consumer Product Safety Commission (CPSC or “Commission”) to promulgate consumer product safety standards for durable infant or toddler products. These standards are to be “substantially the same as” applicable voluntary standards or more stringent than such standards if the Commission determines that more stringent standards would further reduce the risk of injury associated with these products. Section 104(f) defines a durable infant or toddler product as a durable product intended for use, or that may be reasonably expected to be used, by children under the age of 5 years, and includes toddler beds (104(f)(2)(B)).

The ASTM International¹² (ASTM) voluntary standard, ASTM F 1821, *Standard Consumer Safety Specification for Toddler Beds*, establishes requirements for toddler beds. This standard was developed by ASTM in response to incident data supplied by the CPSC staff, and is intended to minimize entrapments in bed end structures, between the guardrail and side rail, and in the mattress support systems of toddler beds. Entrapment of a child’s head or neck can result in asphyxiation. Section 8.4 of ASTM F 1821 – 09 specifies warning statements to be included on toddler beds. Section 8.4.3 states that the warnings shall include the following label, exactly as stated.¹³

¹² ASTM International was formerly known as the American Society for Testing and Materials.

¹³ The version displayed here was created by the Human Factors staff and reflects, to the extent possible, the exact appearance of the warning label shown in the standard. Although the standard is not clear on this point, the Human Factors staff presumes that the warning to be used need not look exactly the same as the version displayed in the standard, but must simply include the exact same content as that version. This interpretation is supported by the fact that the warning label displayed in the standard does not meet

**△ WARNING ENTRAPMENT/STRANGULATION
HAZARD**

Infants have died in toddler beds from entrapment and strangulation. Failure to follow these warnings and the assembly instructions could result in serious injury or death.
NEVER use bed with children under 15 months.
NEVER place bed near windows where cords from blinds or drapes may strangle a child.

Section 8.4.4 specifies additional required warning statements that address the following:

- The minimum mattress dimensions for use on the bed
- The use of provided guardrails to avoid the formation of gaps that could pose an entrapment hazard
- The placement of the bed relative to cords from blinds or drapes
- The elimination of strings, cords, or similar objects around a child's neck
- The elimination of suspended strings over the bed

Like the warning specified in section 8.4.3, all of these additional warning statements appear to be intended to address entrapment and strangulation hazards. This memorandum proposes revisions to these warning requirements that the staff of the CPSC Division of Human Factors believes may reduce the risk of injury associated with the use of toddler beds.

Discussion

The Human Factors staff believes that the warnings section of the standard is confusing as it is currently organized, with explicit warning language for only certain information, “additional” warning statements that leave the applicable hazards open to interpretation, and redundancies between these two sets of required warning information. As noted in the *Background*, the additional warning statements specified in section 8.4.4 apparently address the same hazards addressed by the warning specified in section 8.4.3 of the standard.¹⁴ In addition, the warning label specified in section 8.4.3 merges two distinct hazards into a single label, making it difficult to tell what warning information is associated with each hazard. To address these issues, the Human Factors staff suggests that all of the required warnings specified in section 8.4 be presented as two separate warnings—one addressing the entrapment hazard and the other addressing the strangulation hazard.

Entrapment Warnings

ASTM F 1821 – 09 specifies differing warning requirements for a toddler bed depending upon whether the bed employs a guardrail as the mattress containment means. Specifically, section 8.4.4.2 of the standard states that a toddler bed that employs such a guardrail shall include—unless the guardrail cannot be removed by the consumer—a warning statement telling consumers that the guardrail must be used to avoid the formation of a gap between the mattress and the bed that could cause entrapment. The CPSC staff believes, however, that such a warning statement would not be needed for toddler beds that do not present an entrapment hazard with the guardrail

the type-size requirements specified in section 8.4.2 of the standard, which states that the letters of the word “WARNING” shall be at least 0.2 inches in height.

¹⁴ Section 8.4.4.3 requires an additional warning statement about placing the bed near the cords of blinds and drapes, yet this issue is already addressed explicitly in the warning specified in 8.4.3.

removed. With this in mind, the Human Factors staff proposes two alternative entrapment-related warnings: one for toddler beds that would not meet the performance requirements of the standard with the guardrail removed and one for all other toddler beds.

1. Entrapment warning for toddler beds that do not meet the performance requirements of the standard with the guardrail removed:

⚠️ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.

NEVER use bed with children younger than 15 months.

ALWAYS use supplied guardrails to avoid gaps between mattress and bed.

ONLY use full-size crib mattress of the recommended size.

ALWAYS follow assembly instructions.

2. Entrapment warning for all other toddler beds:

⚠️ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.

NEVER use bed with children younger than 15 months.

ONLY use full-size crib mattress of the recommended size.

ALWAYS follow assembly instructions.

These warnings are consistent with the type-size requirements described in the standard, and the safety alert symbol design is consistent with the latest version of ANSI Z535.4 (2007), *American National Standard for Product Safety Signs and Labels*. The primary differences between these warnings and the relevant portions of the original, required warnings are the following:

The proposed warnings do not state “ENTRAPMENT HAZARD,” which would be analogous to the original “ENTRAPMENT/STRANGULATION HAZARD” statement in the original warning.

The proposed warning places greater emphasis on the subpopulation most at risk and the hazard consequences.

The proposed warning includes a more explicit description of the mechanism that creates the entrapment hazard.

The proposed warning does not state the possibility of serious injury or death from not following the warnings.

To the staff’s knowledge, the minimum age recommendation of 15 months for toddler beds is based largely on the entrapment potential for children younger than this. Thus, the statement that “[i]nfants have died in toddler beds from entrapment and strangulation,” which appears in the original warning, has been carried over with slight revisions to the staff’s proposed warning as, “Infants have died in toddler beds from entrapment.” Given that this statement already explicitly references “entrapment,” the staff believes that including an initial “ENTRAPMENT HAZARD” statement would introduce unnecessary redundancy. Furthermore, omitting this statement from the warning allows one to place greater emphasis on the consequences of the hazard—that is,

death—and the subpopulation most at risk of dying from exposure to the hazard by (1) moving the statement, “Infants have died in toddler beds from entrapment,” toward the beginning of the warning message and (2) reformatting this statement in all-uppercase, boldface type. The ASTM F 1821 subcommittee has pointed out that there continue to be incidents with toddler beds involving children younger than the intended age for these products, so emphasizing the at-risk population is important. In addition, warnings and persuasion research has found that perceived threat plays a significant role in determining whether one complies with a warning (Cameron & DeJoy, 2006; Riley, 2006), so emphasizing the potential for death would tend to increase the efficacy of a warning.

The Human Factors staff believes that the statement in the original warning, “Failure to follow these warnings... could result in serious injury or death,” is unlikely to have a substantial impact on injuries or warning compliance. The warning already communicates the safety importance of its content via a safety alert symbol, the word “WARNING,” and a description of the hazard and its consequences, so the staff believes that telling consumers that not following the warning could result in serious injury or death is redundant.¹⁵ In contrast, explicit hazard information in a warning has been found to lead to higher levels of perceived hazardousness and greater intent to comply with the warning (Laughery & Paige Smith, 2006). The original warning message did not specify the source of entrapment or how entrapment might lead to death, and it is unclear whether many consumers could readily and correctly infer this information. The proposed sentence, “Openings in and between bed parts can entrap head and neck of a small child,” is intended to remedy this situation by providing a more explicit description of the mechanism that creates the hazard.

Section 8.4.4.1 of the standard states that additional warning statements shall address the minimum mattress size. The language of this section implies that the precise mattress dimensions should be provided, both in English and metric units. Section 8.3.2, however, already specifies that both the bed and its retail carton shall be clearly and legibly marked with the intended mattress for the bed, including the precise dimensions in both English and metric units. The Human Factors staff, therefore, believes that repeating precise dimensions within the warning is unnecessary and may add sufficient length to the warning to discourage some consumers from reading it. The staff instead proposes that the warning include a statement such as, “ONLY use full-size crib mattress of the recommended size.”

¹⁵ To the staff’s knowledge, none of the available reports of incidents involving entrapment have been associated with the bed being misassembled. The staff is reluctant to omit the current ASTM label’s direction to follow the assembly instructions, however, since consumer misassembly has been a problem with similar products, such as cribs, and could lead to entrapment.

Strangulation Warning

To address the strangulation hazard, the Human Factors staff proposes the following warning for all toddler beds:

WARNING

STRANGULATION HAZARD

NEVER place bed near windows where cords from blinds or drapes may strangle a child.
NEVER suspend strings over bed.
NEVER place items with a string, cord, or ribbon, such as hood strings or pacifier cords, around a child's neck. These items may catch on bed parts.

Like the proposed entrapment warning labels, this warning is consistent with the type-size requirements described in the standard and the safety alert symbol design is consistent with ANSI Z535.4 – 2007, *American National Standard for Product Safety Signs and Labels*. This warning largely reflects all of the hazard-relevant information required in the original warnings. The staff does believe, however, that the warning statement about not placing items with a string, cord, or ribbon around a child's neck would be more effective with the clarifying sentence, "These items may catch on bed parts." Without this sentence, consumers may find it difficult to infer how the presence of a cord around a child's neck is relevant to the toddler bed or how the cord and bed interact to create the potential for strangulation.

Conclusions

The Human Factors staff has proposed revisions to the required warning text to be included on toddler beds. Specifically, the staff proposes that all toddler beds include two distinct warning labels: one that addresses the entrapment hazard and one that addresses the strangulation hazard. The entrapment warning for toddler beds that have removable guardrails as the mattress containment means would require an additional statement that addresses the need to use the guardrails to avoid hazardous gaps.

Some specific features of the proposed entrapment warning that differ from the original relevant warnings include not stating "ENTRAPMENT HAZARD," reformatting the text to emphasize the potential for death and the subpopulation most at risk of death, omitting the statement that not following the warning could lead to serious injury or death, and including a more explicit description of the mechanism that creates the hazard. The staff has also proposed a separate warning statement regarding the strangulation hazard that includes a brief but explicit description in the strangulation warning of how cords around a child's neck could lead to strangulation.

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Tab D



**UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
BETHESDA, MD 20814**

Memorandum

Date: February 18, 2010

TO : Celestine T. Kiss
Project Manager for Toddler Beds
Division of Human Factors
Directorate for Engineering Sciences

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SUBJECT : Initial Regulatory Flexibility Analysis of Proposed Standard for Toddler Beds

Introduction

On August 14, 2008, the Consumer Product Safety Improvement Act (CPSIA) was enacted. Among its provisions, section 104 requires that the Consumer Product Safety Commission (CPSC) evaluate the currently existing voluntary standards for durable infant or toddler products and promulgate a mandatory standard substantially the same as, or more stringent than, the applicable voluntary standard. Toddler beds are among the durable products specifically named in section 104.

Upon review, CPSC staff proposes adopting the voluntary ASTM International (formerly known as the American Society for Testing and Materials) standard for toddler beds (F 1821 – 09) with a few modifications. The main provisions of the proposed standard include: 1) requirements to minimize torso entrapments in bed end structures, in guardrails, and in the mattress support system, as well as between the guardrail and side rail and between the end structures and the mattress support system; 2) mattress retention requirements intended to prevent openings on the mattress sides in which a child's torso might be entrapped, as well as minimizing the amount the mattress deflects below the mattress support when used by a child of the maximum recommended weight (50 lbs); 3) requirements for partially bounded openings (defined as any opening that is not totally enclosed by boundaries and, therefore, the perimeter is discontinuous); and 4) requirements to address corner post extensions which may catch various children's items (such as clothing), posing a choking hazard. The standard also includes various general requirements, including: bans on hazardous sharp points or edges; bans on scissoring, shearing, or pinching; the permanence of protective components; minimum and maximum opening size requirements to prevent finger entrapment; the permanency and adhesion of labels;

and requirements for instructional literature. In addition to these requirements from the current voluntary standard, CPSC staff recommends adding the following:

- an integrity requirement for guardrails;
- a slat/spindle strength requirement for guardrails, side rails, and end structures;
- guardrail height requirements; and
- modified entrapment and strangulation warnings.

The Regulatory Flexibility Act (RFA) requires that proposed rules be reviewed for their potential economic impact on small entities, including small businesses. Section 603 of the RFA requires that CPSC staff prepare an initial regulatory flexibility analysis and make it available to the public for comment when the general notice of proposed rulemaking is published. The initial regulatory flexibility analysis must describe the impact of the proposed rule on small entities and identify any alternatives that may reduce the impact. Specifically, the initial regulatory flexibility analysis must contain:

1. a description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
2. a description of the reasons why action by the agency is being considered;
3. a succinct statement of the objectives of, and legal basis for, the proposed rule;
4. a description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities subject to the requirements and the type of professional skills necessary for the preparation of reports or records; and
5. an identification, to the extent possible, of all relevant Federal rules which may duplicate, overlap, or conflict with the proposed rule.

Additionally, the initial regulatory flexibility analysis must contain a description of any significant alternatives to the proposed rule which accomplish the stated objectives of the proposed rule while minimizing the economic impact on small entities.

The Product

Toddler beds are basically any bed that uses a full-size crib mattress and is intended to be used only for children 15 months and older who weigh up to 50 pounds. These beds are intended to allow a child to easily get on and off the bed. They may include side rails and/or guardrails. Side rails are, essentially, a rail connecting the headboard to the footboard and may or may not have any barrier purposes. Guardrails, on the other hand, serve as a barrier to prevent the occupant from rolling, sliding, or falling out of bed and cover only a portion of the space between the bed's headboard and footboard. In terms of products covered by the proposed standard, this includes:

- toddler beds – separately marketed beds that use a full-size crib mattress; and
- convertible cribs – cribs that can be converted into a toddler bed using a full-size crib mattress.

Products not covered by the proposed standard include twin beds and daybeds, both of which use twin-size mattresses rather than crib mattresses. In addition, inflatable children's beds or mattresses are not included because they do not use a crib size mattress. It would, however, include what is referred to by some convertible crib manufacturers as a daybed conversion. This type of conversion typically uses the original crib mattress, but does not use any guardrails. Conversion kits may be sold with the crib or separately; either would fall under the proposed standard, because the cribs are intended to convert to a toddler bed.

The Market for Toddler Beds

Toddler beds and convertible cribs are typically produced and/or marketed by juvenile product manufacturers and distributors or by furniture manufacturers and distributors, some of which have separate divisions for juvenile products. CPSC staff believes that there are currently at least 73 known manufacturers or importers supplying toddler beds and/or convertible cribs to the U.S. market. Approximately 48 suppliers are domestic manufacturers (66 percent), 13 are domestic importers (18 percent), 11 are foreign manufacturers (15 percent), and the remaining firm is a foreign supplier who imports from other countries and exports to the United States.¹⁶

Under Small Business Administration (SBA) guidelines, a manufacturer of toddler beds or convertible cribs is small if it has 500 or fewer employees and an importer is considered small if it has 100 or fewer employees. Based on these guidelines, 11 of the domestic importers and 34 domestic manufacturers known to be supplying the U.S. market are small.¹⁷ There are an additional 8 domestic manufacturers of unknown size, most of which are likely to be small.¹⁸ However, there are probably additional unknown small manufacturers and importers operating in the U.S. market as well.

The Juvenile Products Manufacturers Association (JPMA), the major U.S. trade association that represents juvenile product manufacturers and importers, runs a voluntary Certification Program for several juvenile products.¹⁹ Approximately 29 firms supplying toddler beds and/or convertible cribs to the U.S. market are compliant with the current ASTM voluntary standard (40 percent).²⁰ Of the small domestic businesses,²¹ 11 manufacturers (32 percent) and six importers (55 percent) are JPMA-certified as ASTM compliant. Additionally, there are two small

¹⁶ Determinations were made using information from Dun & Bradstreet and ReferenceUSAGov, as well as firm websites. Manufacturers include traditional manufacturers, as well as firms that send out their designs to be manufactured, firms that decorate already manufactured products for final sale, and firms that import but are primarily manufacturers. Importers include one firm that is primarily a manufacturer, but imports its toddler beds from a related, but separate firm. It is unclear whether the foreign supplier designs the products to be manufactured or simply imports already existing products from other countries to ship to the United States.

¹⁷ Six of these small domestic manufacturers have between 100 and 500 employees.

¹⁸ In fact, there was sufficient information to include seven of these firms as small in the analysis that follows.

¹⁹ JPMA has run this program since 1976, beginning with high chairs. Products voluntarily submitted by manufacturers are tested against the appropriate ASTM standard, and only passing products are allowed to display JPMA's Certification Seal. See <http://www.jpma.org/pdfs/certfacts08.pdf> for more information.

²⁰ Twenty-six of these firms are JPMA-certified as compliant, while an additional three firms claim compliance.

²¹ This includes firms suspected of being small as well as those known to be small.

manufacturers that claim compliance with the ASTM standard that are not part of the JPMA Certification Program.

The most recent U.S. birth data shows that there are approximately 4.3 million births per year.²² The vast majority of these babies eventually use cribs for sleeping purposes.²³ In fact, according to a 2005 survey conducted by the American Baby Group (*2006 Baby Products Tracking Study*),²⁴ 22 percent of new mothers²⁵ own convertible cribs. Approximately 16 percent of convertible cribs were handed down or purchased second-hand.²⁶ If these rates hold, this suggests annual convertible crib sales of about 795,000 ($0.22 \times 0.84 \times 4.3$ million births per year). Of those consumers with non-convertible cribs,²⁷ some proportion of them will eventually use toddler beds when their children get older. However, consumers may choose to use a twin or larger bed and use portable bed rails rather than use a separate toddler bed.²⁸ Assuming that approximately 50 percent elect to use toddler beds and that approximately 50 percent buy them new, this would mean that around 839,000 toddler beds are sold per year (0.78 percent non-convertible cribs \times 4.3 million births \times 0.5 percent use toddler beds \times 0.5 percent buy them new).²⁹ Adding this to the estimate of convertible cribs yields a total of approximately 1.6 million units (convertible cribs and toddler beds) sold per year that might be affected by the proposed toddler bed standard.

Reason for Agency Action and Legal Basis for the Draft Proposed Rule

Section 104 of the CPSIA requires CPSC to promulgate a mandatory standard for toddler beds that is substantially the same as, or more stringent than, the voluntary standard. CPSC staff is recommending four additional requirements to the current ASTM standard. The first would assure more structurally sound guardrails. The second is intended to reduce the likelihood of entrapments due to broken slats/spindles in guardrails, side rails, and end structures. The third is proposed to improve the safety of guardrails by adding a height requirement. The last, modified warnings, is intended to emphasize that deaths have occurred due to entrapment and

²² U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (CDC), National Center for Health Statistics, National Vital Statistics System, "Births: Preliminary Data for 2007," *National Vital Statistics Reports* Volume 57, Number 12 (March 18, 2009): 6 (Table 1). Number of live births in 2007 is rounded from 4,317,119.

²³ Although there is some evidence that play yards are becoming a common substitute.

²⁴ The data collected for the *Baby Products Tracking Study* does not represent an unbiased statistical sample. The sample of 3,600 new and expectant mothers is drawn from American Baby magazine's mailing lists. Also, since the most recent survey information is from 2005, it may not reflect the current market.

²⁵ New mothers represent those who have recently given birth, as opposed to expectant mothers. Therefore, the application to annual births is appropriate.

²⁶ The data on second-hand products for new moms was not available. Instead, data for new moms and expectant moms was combined and broken into first-time mothers and experienced mothers. Data for first-time mothers and experienced mothers has been averaged to calculate the approximate percentage that was handed down or purchased second-hand.

²⁷ This assumes that all consumers without convertible cribs have non-convertible cribs. This is likely an overestimate.

²⁸ These beds and rails may be purchased new, purchased second-hand, borrowed, etc.

²⁹ Any per year estimate for toddler beds will be approximate since when parents make such a purchase for their child is likely to vary.

strangulation. CPSC staff believes that the more stringent recommended standard would reduce the risk of future injuries and deaths associated with toddler beds and convertible cribs.³⁰

Compliance Requirements of the Proposed Rule

CPSC staff recommends adopting the voluntary ASTM standard for toddler beds with four modifications. Key components of the current ASTM standard for toddler beds (F 1821 – 09) include:³¹

- Mattress retention – intended to control the horizontal position of the mattress and prevent torso entrapments, as well as assure that the mattress does not fall too far below the mattress support when used by a child of the maximum recommended weight (50 lbs).
- Mattress support systems – intended to prevent disengagement which might result in a sharp edge or an opening in which a child might become entrapped.
- Mattress support systems attached to end structures – intended to assure that the mattress support system remains attached to the end structures and does not create a hazard, such as sharp edges or openings in which a child might become entrapped.
- Guardrails – intended to prevent openings in guardrails in which children might be trapped.
- End structures – intended to prevent openings in end structures in which children might be trapped.

The voluntary standard also includes: 1) requirements for several features to prevent entrapment and cuts (minimum and maximum opening size, hazardous sharp points or edges, and edges that can scissor, shear, or pinch); 2) torque and tension tests to assure that components cannot be removed; 3) requirements for partially bounded openings; 4) marking and labeling requirements; 5) requirements for the permanency and adhesion of labels; 6) requirements for instructional literature; and 7) requirements to address corner post extensions which may catch various children's items and pose a choking hazard.

As described below, CPSC staff recommends modifying the existing ASTM standard by revising the entrapment/strangulation warnings, and adding three new requirements.³²

³⁰ Memorandum from Jacob J. Miller, ESME, Directorate for Engineering Sciences, dated February 18, 2010, Subject: Proposed Changes to the ASTM Voluntary Standard for Toddler Beds, ASTM F 1821 – 09 for Incorporation in a Proposed Mandatory Standard and memorandum from Timothy P. Smith, Division of Human Factors, Directorate for Engineering Sciences, dated February 18, 2010, Subject: Warning Statements for Toddler Beds (CPSIA Section 104).

³¹ JPMA, *ASTM Standards listed in JPMA Directory*, http://www.jpma.org/pdfs/JPMA_Directory_Final2008.pdf.

³² Memorandum from Jacob J. Miller, ESME, Directorate for Engineering Sciences, dated February 18, 2010, Subject: Proposed Changes to the ASTM Voluntary Standard for Toddler Beds, ASTM F 1821 – 09 for Incorporation in a Proposed Mandatory Standard and memorandum from Timothy P. Smith, Division of Human Factors, Directorate for Engineering Sciences, dated February 18, 2010, Subject: Warning Statements for Toddler Beds (CPSIA Section 104).

- Addition to existing requirements
 - Entrapment/strangulation warnings – CPSC staff recommends modifying the existing warnings, by adding a more detailed description of mechanisms creating each hazard, omitting redundant information, and separating the entrapment and strangulation messages into two warning labels. These revisions are intended to increase the efficacy of the warning by emphasizing the potential for death for the two different mechanisms. CPSC staff also recommends requiring a slightly different entrapment label for toddler beds that do not meet performance requirement with the guardrail removed.³³
- New requirements
 - Structural integrity for guardrails – In addition to the already existing test for guardrail openings, CPSC staff recommends adding a test for the overall stability of guardrails using a 50-pound weight while the bed is firmly secured. This additional test is intended to prevent children from falling out of bed; it is also calculated to ensure that the guardrails remain intact when children lean against them or attempt to use them to climb into bed.
 - Slat/spindle strength – CPSC staff recommends testing 100 percent of the slats and spindles in toddler bed guardrails, side rails, and end structures;³⁴ 25 percent of these slats would be tested at 80 lbf and the remaining 75 percent would be tested at 60 lbf. This testing requirement is recommended by CPSC staff to assure that neither toddler bed slats/spindles nor their joints break and allow an opening in which a child could become entrapped.
 - Guardrail height – CPSC staff recommends that guardrails be a minimum height of 5 inches above the manufacturer’s recommended sleeping surface. This is also intended to help prevent falls.

The recommended standard would require that toddler beds/convertible cribs entering commerce meet the new requirements within six months of publication of the final rule.³⁵ It would not be retroactive.

The recommended slat/spindle strength requirement for guardrails, side rails, and end structures may help prevent incidents where slats break and children are either cut, fall through, or become entrapped. This proposed modification to the current voluntary standard could potentially add significant costs to toddler bed and convertible crib suppliers. Preliminary testing indicates that some toddler beds and convertible cribs currently on the market would meet this requirement with no further modifications, while others would not.³⁶ Plastic toddler beds would be exempt from the slat/spindle strength requirement, because they do not have slats/spindles. Therefore, it is believed that some products will need to be modified to meet the slat/spindle requirement, which is likely to affect at least a few firms.

³³ Under these circumstances, CPSC staff recommends adding the statement “ALWAYS use supplied guardrails to avoid gaps between mattress and bed” to the entrapment warning label.

³⁴ This would not, however, apply to mattress support system slats.

³⁵ A shorter effective date would increase compliance costs for all firms.

³⁶ Based on discussions with Jacob J. Miller, Directorate for Engineering Sciences.

Suppliers may also need to make product modifications to meet the new structural integrity and height requirements for guardrails. No testing has been performed so far that would indicate how many products currently on the market would meet these requirements, but casual observation suggests that at least some products will be able to meet the guardrail height requirements. It is possible for firms to eliminate guardrails from their products entirely as a way to address the proposed requirements (guardrails themselves are not a requirement). However, it is unreasonable to assume that all of the firms whose products may require modifications will take this approach. Therefore, it is expected that at least some products will require modifications to meet these guardrail requirements and that at least a few firms may be affected.

In meeting the slat/spindle strength and guardrail structural integrity requirements, it is possible that some firms may change the quality of materials used to make the slats/spindles and/or guardrails.³⁷ For wooden toddler beds/convertible cribs, switching to a stronger material is unlikely to exceed more than a few dollars per unit.³⁸ Plastic toddler beds/convertible cribs would not need to make modifications to comply with the slat/spindle testing requirement, although they might require modifications to meet the guardrail structural integrity requirement. Metal toddler beds/convertible cribs are less common than products made from wood or plastic, but it is not believed that material changes for either plastic or metal products would be substantially more expensive than for wooden products. Alternatively, firms could undertake product redevelopment to develop compliant toddler beds, which would likely be more expensive than using alternate materials. Therefore, it is likely that at least some would select the less expensive option.

Increasing the height of guardrails may prevent children from falling through them.³⁹ As discussed above, guardrails are not required to be included with toddler bed or convertible cribs, so firms with noncompliant products have the option of eliminating guardrails entirely. Alternatively, they could redesign their product (or the guardrail portion of their product) to make their guardrails higher. If the second option is taken, there will likely be some cost associated with product redevelopment, as well as some increased costs for additional materials.

The entrapment and strangulation warnings are expected to have only a minimal impact on current suppliers of toddler beds or convertible cribs. The revised warnings represent minor modifications for firms currently complying with the ASTM standard. Even for those firms supplying toddler beds without such warnings or with warnings that differ from the one outlined in the current voluntary standard, the costs associated with printing revised warnings or completely new warnings would be low.

³⁷ Alternatively, they may increase the robustness of slat geometry or improve joint integrity (i.e., how the slats are attached to the side rails). Based on e-mail correspondence with Jacob J. Miller, Directorate for Engineering Sciences.

³⁸ For example, using white ash rather than western white pine improves average strength properties by an average of 74 percent (http://www.woodbin.com/ref/wood/strength_table.htm) while increasing price by an average of 26 percent (<http://www.willardbrothers.net/ORDER%20FORM.htm>) for a maximum of \$1.55 more for the largest quantity listed. These cost differentials are based on raw lumber costs which would affect firms differently, depending upon how much wood was used in their particular product.

³⁹ Memorandum from Risana Chowdhury, EPI, Directorate for Epidemiology, dated January 28, 2010, Subject: Toddler Beds-Related Deaths, Injuries and Potential Injuries, and NEISS Injury Estimates; 2005 – Present.

Other Federal Rules

CPSC staff has not identified any federal or state rule that either overlaps or conflicts with the staff's draft proposed rule.

Impact on Small Businesses

There are 73 firms currently known to be marketing toddler beds and/or convertible cribs in the United States. Six are large domestic manufacturers, one is a domestic manufacturer of unknown size, two are large domestic importers, and twelve are foreign firms. The impact on the remaining 52 small firms—34 small domestic manufacturers, seven presumed to be small domestic manufacturers,⁴⁰ and 11 small domestic importers—is the focus of the remainder of this analysis.

Small Domestic Manufacturers

For the most part, the impact of the proposed standard on small manufacturers will differ based on whether they are currently compliant with the voluntary ASTM standard. If they are not compliant, as is the case with 28 firms, the impact could be significant. These firms would likely have to undergo product redevelopment. As explained below, the cost of such an effort for toddler beds/convertible cribs is unknown, but could be substantial for some firms.

Product development costs include product design, development and marketing staff time, product testing, and focus group expenses. These costs can be very high, particularly when there are multiple products,⁴¹ but they can be treated as new product expenses and amortized over time. Other one-time costs include the retooling of manufacturing equipment, which could also be gradually recouped over the sales of numerous units. There are also expected to be increased costs of production. Producing toddler beds and convertible cribs that have greater structural integrity, stronger slats/spindles, and higher guardrails may require additional raw materials or possibly heavier materials. In addition to increasing the costs of production, this could increase the shipping costs as well.

Even if these firms are able to pass their increased costs on to consumers, the impact could still be considerable. This is because firms manufacturing toddler beds and convertible cribs are not simply competing against other producers of toddler beds and convertible cribs. They are competing against producers of substitute products as well, firms that would not be covered under the recommended standard. Toddler bed producers must compete with producers of twin (or possibly larger) beds which can be used with portable guardrails, while convertible cribs

⁴⁰ There are eight manufacturers of unknown size. A variety of evidence (including information from Dun & Bradstreet and ReferenceUSAGov, as well as firm websites) indicates that seven of these firms may be small. Assuming that these firms are small likely overestimates the impact of the staff-recommended rule on small businesses.

⁴¹ Although there may be some economies of scale for many of these development stages, thereby reducing the marginal costs for each new product under redevelopment.

must compete with these same products when children are larger and with standard cribs for smaller children.

There is expected to be less impact on the 13 firms that are known to be in compliance with the current voluntary standard. It is believed that at least some of these firms may be able to comply with the new requirements without product modifications (except for labeling).⁴² The remaining firms may opt to redesign their product(s) as well, which again would result in some one-time costs as well as a possible increase in production costs. It is also possible, however, that they may be able to select a potentially less expensive option to address some of the recommended requirements; a modification in the materials used may be sufficient for many products, and the associated cost is not expected to exceed a few dollars per unit.⁴³

There are two manufacturers that are not compliant with the current voluntary ASTM standard that would be affected differently by the proposed standard. They are firms that take already manufactured toddler beds and convertible cribs, decorate them (often with original artwork), and then sell them as a final product. Since these firms do not make the underlying toddler beds/convertible cribs, the impact of the proposed standard will be the same as that of an importer. They would need to find a new supplier of compliant products if their current supplier does not make the necessary modifications. The new products would presumably be higher quality as well as more expensive, as some of the original manufacturer's production costs (and possibly redevelopment costs) are passed on to these firms.

The scenario described above assumes that only those firms that are JPMA-certified or claim ASTM compliance will pass the voluntary standard's requirements. This is not necessarily the case. CPSC staff has identified many cases where products not certified by JPMA are actually compliant with the relevant ASTM standard; however, there is insufficient evidence of this for toddler beds/convertible cribs to quantify this impact. Additionally, the effect of the new and modified requirements may be less substantial than outlined above to the extent that some products may already comply with non-U.S. standards with some more rigorous requirements. However, there is insufficient information to quantify this effect.

Small Domestic Importers

The majority of small domestic importers are compliant with the current voluntary standard (six out of eleven). It is believed that at least some of these firms will not need to make any additional product modifications to meet the proposed standard (except for labeling). However, those whose products do require modifications will need to find an alternate supplier if their existing one does not come into compliance. The new products will presumably be of higher quality, as well as more expensive. However, the actual price increase is unknown and likely to vary based upon the degree of modifications required. All of the remaining five firms not in compliance with the ASTM voluntary standard would need to find suppliers compliant with the

⁴² Preliminary testing is minimal at present. However, at least some products are able to meet the slat/spindle testing requirements and some appear compliant with the guardrail height requirements. Based on discussions with Jacob J. Miller, Directorate for Engineering Sciences.

⁴³ This estimate is based on comparing the relative strength of various woods to their prices. See footnote 21 above for an example.

proposed standard or assure that their current supplier made the modifications necessary to comply. Depending on the degree to which their toddler beds and convertible cribs are out of compliance with the voluntary standard, the price increase (as well as the increases in quality and safety) could be relatively high. To the extent that some of these firms may actually comply with the current voluntary standard or one or more of the new/modified requirements in the recommended standard, the impact of the recommended rule would be lower.

For the most part, the impact on importers tends to be smaller than that on manufacturers. Even if importers responded to the rule by discontinuing the import of their non-complying toddler beds and convertible cribs, either replacing them with a complying product or another juvenile product, deciding to import an alternative product would be a reasonable and realistic way to offset any lost revenue. The one exception would be firms for which convertible cribs/toddler beds and their associated products (i.e., matching furniture) form the core of their product line. For these firms, a substantial price increase could possibly drive them out of business or require them to rebuild their business based on alternative products.

Alternatives

Under section 104 of the CPSIA, the primary alternative that would reduce the impact on small entities is to make the voluntary standard mandatory with no modifications. For small domestic manufacturers that already meet the requirements of the voluntary standard, adopting the standard without modifications may reduce their costs relative to the recommended standard, but only marginally. Similarly, limiting the requirements of the standard to those already in the voluntary standard would probably have little beneficial impact on small manufacturers that do not currently meet the requirements of the voluntary standard. This is because, for these firms, most of the cost increases would be associated with meeting the requirements of the current voluntary standard, rather than the changes associated with the proposed standard. The difference for importers, whether compliant with the voluntary standard or not, is also likely to be minimal.

Conclusion

It is possible that the proposed standard could have a significant impact on a substantial number of small entities.⁴⁴ Firms supplying products already compliant with the voluntary standard may not need to make any product modifications to meet the proposed standard, but this is known to apply to only 42 percent of the small firms identified. Some of these firms and all other firms will need to make at least some modifications to their toddler beds and convertible cribs to comply with the recommended standard. The extent of these costs is unknown, but since product redevelopment would likely be necessary in many cases, it is possible that the costs could be large and have the potential to reduce firms' ability to compete with substitute products.

⁴⁴ Even if *all* the small firms that are JPMA-certified as compliant with ASTM's voluntary standard did not require any additional changes to comply with the proposed standard, there would still be 63 percent (33 out of 52 firms) that would probably need to undergo product redevelopment to comply. This would typically need to be done for multiple products. To the extent that some of the products not certified by JPMA may still comply, the impact will be reduced.

A few small businesses have product lines consisting entirely or primarily of toddler beds, convertible cribs, and related products (such as accompanying furniture).⁴⁵ These firms may be disproportionately affected by any proposed standard. If the cost of developing (or importing) a compliant product proves to be a barrier for these firms, the loss of toddler beds and convertible cribs as a product category could be significant and may not be easily mitigated by the sale of other juvenile products.

⁴⁵ There are five firms that seem to be entirely dependent on these products as the core of their product lines with an additional fourteen firms that are primarily dependent upon these products. For the latter, however, it should be noted that a few firms also produce some non-convertible cribs and therefore may be able to adjust their product lines to use exclusively non-convertible cribs.

Draft Notice of Proposed Rulemaking (“NPR”)
Safety Standard for Toddler Beds

-DRAFT-

6355-01 P

CONSUMER PRODUCT SAFETY COMMISSION

16 CFR Part 1217

[No. CPSC-2010-00__]

RIN 3041-AC79

Safety Standard for Toddler Beds

AGENCY: Consumer Product Safety Commission.

ACTION: Proposed rule.

SUMMARY: Section 104(b) of the Consumer Product Safety Improvement Act of 2008 ("CPSIA") requires the United States Consumer Product Safety Commission ("Commission," "CPSC") to promulgate consumer product safety standards for durable infant or toddler products. These standards are to be "substantially the same as" applicable voluntary standards or more stringent than the voluntary standard if the Commission concludes that more stringent requirements would further reduce the risk of injury associated with the product. The Commission is proposing a safety standard for toddler beds in response to the direction under section 104(b) of the CPSIA. The proposed safety standard would address entrapment in bed end structures, entrapment between the guardrail and side rail, entrapment in the mattress support system, and component failures of the bed support system and guardrails. The proposed standard also

addresses corner post extensions that can catch items worn by a child.

DATES: Submit comments by [INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

Submit comments relating to the instructional literature and bed and carton marking required by the proposed rule, as these materials relate to the Paperwork Reduction Act, by [INSERT DATE THAT IS 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Comments relating to the instructional literature and bed and carton marking required by the proposed rule relating to the Paperwork Reduction Act should be directed to the Office of Information and Regulatory Affairs, OMB, Attn: CPSC Desk Officer, FAX: 202-395-6974, or e-mailed to oir_submission@omb.eop.gov.

Other comments, identified by Docket No. CPSC-2010-00__, may be submitted by any of the following methods:

1. *Electronic Submissions.* Submit electronic comments to the Federal eRulemaking Portal: <http://www.regulations.gov>. Follow the instructions for submitting comments. (To ensure timely processing of comments, the Commission is no longer directly accepting comments submitted by electronic mail (email). The

Commission encourages you to submit electronic comments by using the Federal eRulemaking Portal, as described above.)

2. *Written Submissions.* Submit written submissions in the following ways:

a. *FAX:* 301-504-0127.

b. *Mail/Hand delivery/Courier* (for paper, disk, or CD-ROM submissions): Office of the Secretary, Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814.

Instructions: All submissions received must include the agency name and docket number for this rulemaking. All comments received, including any personal information provided, may be posted without change to <http://frwebgate.access.gpo.gov/cgi-bin/leaving.cgi?from=leavingFR.html&log=linklog&to=http://www.regulations.gov>. Accordingly, we recommend that you not submit confidential business information, trade secret information, or other sensitive information that you do not want to be available to the public.

Docket: For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> and insert the docket number, CPSC 2010-00__, into the "Search" box and follow the prompts.

FOR FURTHER INFORMATION CONTACT: *Technical information:*

Celestine Kiss, Division of Human Factors, Directorate for Engineering Sciences, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814; telephone (301)504-7739, email ckiss@cpsc.gov. *Legal information:*

Harleigh Ewell, Office of the General Counsel, Consumer Product Safety Commission, 4330 East West Highway, Bethesda, MD 20814; telephone (301)504-7683; email hewell@cpsc.gov.

SUPPLEMENTARY INFORMATION:

A. Background - The Consumer Product Safety Improvement Act as Applied to Durable Infant or Toddler Products

The Consumer Product Safety Improvement Act of 2008 ("CPSIA," Pub. L. 110-314) was enacted on August 14, 2008. Section 104(b) of the CPSIA requires the Commission to promulgate consumer product safety standards for durable infant or toddler products. These standards are to be "substantially the same as" applicable voluntary standards or more stringent than the voluntary standard if the Commission concludes that more stringent requirements would further reduce the risk of injury associated with the product. The term "durable infant or toddler product" is defined in section 104(f) of the CPSIA as a durable product

intended for use, or that may be reasonably expected to be used, by children under the age of 5 years. Toddler beds are one of the products specifically identified in section 104(f)(2) of the CPSIA as a durable infant or toddler product.

In this document, the Commission proposes a safety standard for toddler beds. The proposed standard is largely the same as a voluntary standard developed by ASTM International (formerly the American Society for Testing and Materials), ASTM F 1821-09 *Standard Consumer Safety Specification for Toddler Beds*, but with several modifications that strengthen the standard. The ASTM standard is copyrighted, but can be viewed as a read-only document, only during the comment period on this proposal, at [insert link], by permission of ASTM. Documents that support statements in this notice are identified by [Ref. #], where # is the number of the reference document as listed below in section L of this notice.

B. The Product

The ASTM voluntary standard defines a toddler bed as any bed sized to accommodate a full-size crib mattress having minimum dimensions of 51 5/8 inches in length and 27 1/4 inches in width and that is intended to provide free access and egress to a child

not less than 15 months of age and weighing no more than 50 pounds.

C. Incident Data (Ref. 2)

1. *Introduction.* CPSC databases did not have a dedicated product code for identifying incidents before 2005 that involved toddler beds. Accordingly, the data discussed below begins with the year 2005. The data come from two databases: (1) actual injuries and fatalities of which the Commission is aware; and (2) estimates derived from reports of emergency-room treatment in a statistical sample of hospitals that makes up the National Electronic Injury Surveillance System ("NEISS"). The CPSC staff is aware of 4 fatalities and 81 nonfatal incidents (with and without injuries) related to toddler beds that were reported to have occurred since 2005.

2. *Fatalities.* Of the four fatalities reported to CPSC staff, two resulted from entrapments. The first death was the result of a 6-month-old infant getting entrapped in the footboard while sleeping on a toddler bed. The second death involved a 13-month-old getting entrapped in the side rail of a flipped-over toddler bed while playing with an older sibling. The third death was due to asphyxiation when a 10-month-old was napping in an inflatable children's

bed. (Although an inflatable children's bed does not meet the definition of a toddler bed that is in ASTM F 1821-09, this incident was coded as associated with a toddler bed.) The last fatality was a strangulation death of a 3-year-old on the cord of mini blinds located over his toddler bed. (The ASTM F 1821-09 standard addresses this hazard with a warning label. The Commission does not have information indicating whether the toddler bed involved in this death bore such a warning label.) It is notable that three of the four reported fatalities involved victims under the age of 15 months, which is recommended in the current ASTM voluntary standard as the minimum age for use of a toddler bed. The ASTM standard requires a label warning against using the bed with children under 15 months.

3. *Nonfatal Incidents.* Of the 81 nonfatal incidents known to the CPSC staff that were associated with a child on a toddler bed, 26 involved injuries. Three of the injuries were fractures of limbs. The vast majority of the injuries were bumps and bruises. Sprains, scrapes, and lacerations were some of the other reported injuries associated with toddler beds.

Listed below are the hazard patterns identified among the reports of nonfatal incidents:

- Entrapment was the most commonly reported hazard. Approximately 31 percent of the incidents involved entrapment of a limb. The associated injuries, if any, ranged from fractures to sprains to bruises. More serious, potentially fatal, entrapments of head or body in the side rails, in the mesh covering of the side rails, or between the mattress-support rails were reported in 14 percent of the incidents.
- Broken, loose, or detached components of the bed, such as the guardrail, hardware, or other accessories, were the next most commonly reported problems. However, only two injuries--one laceration and one ingestion--resulted from these problems.
- Product integrity issues, mostly integrity of the mattress-support, were the next most commonly encountered hazard. These often resulted in the collapse of the bed, causing the child to fall through.
- Inadequate mattress-fit issues were the next most common hazard. A few children suffered sprains and broken limbs from being caught in the gap between the mattress and the bed frame.

- Finally, there were some complaints of paint/coating issues, bed height/clearance issues, and inadequacy of guardrails, assembly instructions, and recalls.

Among the nonfatal incidents that reported the child's age (67 out of 81), the age ranged between 11 months to 6 years. Nearly 51 percent of these incidents reported the age to be between 18 and 24 months. However, it was not always clear that the reported age pertained to the child who was the regular user of the toddler bed. Three of the 81 nonfatal incident reports involved inflatable children's beds, which do not conform to the ASTM definition of toddler beds and are not included within the scope of the proposed standard.

4. *National Injury Estimates.* There were an estimated 1,380 injuries related to toddler beds that were treated in hospital emergency departments in the United States over the 4-year period from 2005 to 2008. The injury estimates for individual years are not reportable because the numbers each year fail to meet NEISS's publication criteria. There was no statistically significant increase or decrease observed in the estimated injuries from one year to the next, and there was no statistically significant trend observed over the 2005-2008 period. No deaths were reported through NEISS. For the

emergency department-treated injuries related to toddler beds, the following characteristics occurred most frequently:

- Hazard - falls out of the toddler bed to a lower level (87%).
- Injured body part - head (30%) and face (24%).
- Injury type - lacerations (26%) and contusions/abrasions (20%).
- Disposition - treated and released (nearly 100%).

The age of patients in these injuries ranged between 4 months and 6 years, with nearly 53 percent between 18 months and 2 years. It was not always clear whether the patient injured was the usual user of the toddler bed.

D. The ASTM Voluntary Standard

The ASTM F 1821-09 voluntary standard contains requirements addressing a number of hazards. The requirements include:

1. Toddler beds must comply with CPSC's regulations at 16 CFR 1303 (ban of lead in paint), 1500.48 (sharp points), 1500.49 (sharp edges), 1500.50 through 1500.53 (use and abuse tests), and 1501 (small parts that present choking, aspiration, or ingestion hazards), both before and after the product is tested according to the standard.

2. Toddler beds must not present scissoring, shearing, or pinching hazards.
3. Openings must meet specified dimensions in order to prevent finger entrapment.
4. Openings that will permit passage of a specified block with a wedge on one end are prohibited in order to protect against torso entrapment.
5. The distance that corner posts may extend above the upper edge of an end or side panel is limited.
6. Protective components shall not be removable with a specified force after torque and tension tests.
7. There are requirements for marking and labeling each bed and its retail carton, and for warning statements on the bed. There are requirements for the permanency of labels and warnings.
8. The mattress shall be supported and contained so that it does not move horizontally to cause a horizontal opening that will allow the passage of the wedge block when tested.
9. There are tests for the physical integrity of the mattress support system and its attachments and the side rails.
10. There are wedge block tests for openings in the guardrails and end structures that could cause entrapment.

11. There is a probe test to protect against entrapment in partially-bounded openings in the bed.

12. Instructions must be provided with the bed.

13. Warning statements are required on the bed to address entrapment and strangulation hazards.

E. Description of the Proposed Rule and its Changes to the ASTM Standard

Due to the significant number of incidents reported regarding component failures of bed support systems and guardrails, the Commission's staff has recommended additional testing requirements to address those types of incidents. Accordingly, the Commission proposes a new 16 CFR 1217 that, if finalized, would adopt the ASTM standard F 1821-09 by reference, but with some changes and additions that would strengthen the ASTM standard's provisions.

1. Scope, application, and effective date (Proposed § 1217.1)

Proposed § 1217.1 would state that part 1217 establishes a consumer product safety standard for toddler beds manufactured or imported after a date that would be 6 months after the publication date of a final rule in the FEDERAL REGISTER.

2. Requirements for toddler beds (Proposed § 1217.2)

a. The applicable ASTM standard (Proposed § 1217.2(a))

Proposed § 1217.2(a) would explain that, except as provided in § 1217.2(b), each toddler bed as defined in ASTM F 1821-09, "Standard Consumer Safety Specification for Toddler Beds," must comply with all applicable provisions in ASTM F 1821-09. The proposal also would explain how interested parties may obtain a copy of the ASTM standard or inspect a copy at the CPSC.

b. Minimum height for the upper edge of guardrails (Proposed § 1217.(b)(1) through (3)).

Proposed § 1217.2(b)(1) through (3) would revise the ASTM standard to require that guardrails be a minimum height of 5 inches above the manufacturer's recommended sleeping surface. This is intended to help prevent falls. Although the proposed standard does not require guardrails, persons who choose to have guardrails on their toddler beds should be able to rely on the guardrail performing the function of helping to prevent falls. The 5-inch minimum height is widely adopted by industry as a minimum height for guardrails in bunk beds [Ref. 3].

c. Structural Integrity of Guardrails (Proposed § 1217.2(b)(4) and 1217.2(b)(6)).

In addition to the already existing test for guardrail openings, the Commission, at proposed § 1217.2(b)(4) and 1217.2(b)(6), would add a test for the overall stability of guardrails using a 50-lb force while the bed is firmly secured. The force is to be applied at both the center of the guardrail and at the free end of the guardrail. This additional test is intended to prevent children from falling out of bed; it is also calculated to ensure that the guardrails remain intact when children lean against them or attempt to use them to climb into bed. The 50-lb force was chosen because that is the maximum weight of a child that should use a toddler bed [Ref. 3]. After testing in accordance with 7.9, the guardrail shall not be broken or detached or create a condition that would present any of the hazards described in section 5. The guardrail also shall not be deformed or displaced so as to create a hazard addressed by the performance requirements of section 6.

c. Slat/Spindle Testing for Guardrails, Side Rails, and End Structures (Proposed § 1217.2(b)(5) and 1217.2(b)(7))

Currently, the torso wedge is used in combination with a 25-pound force ("lbf") on guardrails and end

structures in the most adverse orientation to assure that the slats or spindles (hereafter referred to collectively as "slats") do not break and allow an opening in which a child could become entrapped. Proposed § 1217.2(b)(5) and 1217.2(b)(7) would modify the existing ASTM test requirements in the following ways.

First, 25 percent of all slats, rather than just those of the end structures and guardrails, would be tested using 80 lbf instead of 25 lbf. The slats that present the least resistance to bending shall make up the 25 percent, except that when a slat is selected for testing with 80 lbf, neither of its adjacent slats shall be tested at that force. The 80 lbf is chosen on the basis of tests performed by the Commission's staff on 18 cribs or toddler beds that were involved in actual breakage incidents in the field ("incident beds") and on two samples of a model of a crib that has been widely sold to consumers and has not been reported to have been involved in a breakage incident ("the non-incident crib") [Ref. 3].

There is very little anthropometric data available to help determine the forces a child can apply to a bed slat. The tests of the slats of the non-incident crib

produced failures of the slats at forces ranging from 85 lb to 123.5 lb [Ref. 3]. Since there have not been any incidents reported for this model crib despite its wide distribution, it is reasonable to conclude that the occupants of this crib can exert a force on the slats that is somewhat less than the minimum failure force of 85 lb obtained for this crib. The 18 incident beds tested had minimum failure forces ranging from 28.8 lb to 78.8 lb [Ref. 3]. Taken together, these two sets of failure forces support setting a maximum test force of 80 lb.

However, when testing the non-incident crib model, the Commission's staff observed that testing adjacent slats significantly compromised the integrity of the bed rails [Ref. 3]. This occurred even at the lower end of the range of failure forces, *i.e.*, 85 to 90 lb. Therefore, it is plausible that testing all slats to 80 lbf would have a similar effect and be too stringent a test. Accordingly, the Commission is proposing that 25 percent of the slats be tested to 80 lbf so that adjacent slats would not have to be tested at that force. The Commission proposes that the remaining 75 percent of slats be tested at 60 lbf. This reduction in force is intended to compensate for any damage to the bed rail caused by testing an adjacent slat to 80

lbf and is a much higher force than the 25 lbf specified in the current ASTM standard. The Commission concludes that the force of 60 lb is adequate for these remaining slats since the slats with geometry that is most likely to bend (and thus break) will have been tested to the full 80 lbf.

d. Improved warning label (Proposed § 1217.2(b)(8))
(Ref. 4)

ASTM F 1821-09 is intended to minimize entrapments in bed end structures, between the guardrail and side rail, and in the mattress support system. Entrapment of a child's head or neck can result in asphyxiation. Section 8.4 of ASTM F 1821-09 specifies warning statements to be included on toddler beds. Section 8.4.3 of ASTM F 1821-09 states that the warnings shall include the following label, exactly as stated:

**△ WARNING ENTRAPMENT/STRANGULATION
HAZARD**

Infants have died in toddler beds from entrapment and strangulation. Failure to follow these warnings and the assembly instructions could result in serious injury or death.
NEVER use bed with children under 15 months.
NEVER place bed near windows where cords from blinds or drapes may strangle a child.

Section 8.4.4 of ASTM F 1821-09 specifies additional required warning statements that address the following:

1. The minimum mattress dimensions for use on the bed;

2. The use of provided guardrails to avoid the formation of gaps that could pose an entrapment hazard;
3. The placement of the bed relative to cords from blinds or drapes;
4. The placement of strings, cords, or similar objects around a child's neck; and
5. The suspension of strings over the bed.

Like the warning label specified in section 8.4.3 of ASTM F 1821-09, all of these additional warning statements appear to be intended to address entrapment and strangulation hazards. Proposed § 1217.2(b)(6) would revise these warning requirements to reduce the risk of injury associated with the use of toddler beds.

The Commission's Human Factors staff believes that the warnings section of ASTM F 1821-09 is confusing as it is currently organized, with explicit warning language for only certain information, "additional" warning statements that leave the applicable hazards open to interpretation, and redundancies between these two sets of required warning information [Ref. 4]. The additional warning statements specified in section 8.4.4 of ASTM F 1821-09 apparently address the same hazards addressed by the warning label specified in section 8.4.3 of ASTM F 1821-09. (Section 8.4.4.3 of ASTM F 1821-09 requires an additional warning

statement about placing the bed near the cords of blinds and drapes, yet this issue is already addressed explicitly in the warning label specified in 8.4.3 of ASTM F 1821-09.) In addition, the warning label specified in section 8.4.3 of ASTM F 1821-09 merges two distinct hazards into a single label, making it difficult to tell what warning information is associated with each hazard. To address these issues, the Human Factors staff suggested that all of the required warnings specified in section 8.4 of ASTM F 1821-09 be presented as two separate warnings, one addressing the entrapment hazard and the other addressing the strangulation hazard, and proposed § 1217.2(b)(8) reflects the two warnings.

(i) *Entrapment warning.*

ASTM F 1821-09 specifies different warning requirements for toddler beds that employ a removable guardrail as the mattress containment means. Specifically, section 8.4.4.2 of ASTM F 1821-09 states that toddler beds that employ a removable guardrail for this purpose shall include a warning statement telling consumers that the guardrail must be used to avoid the formation of a gap between the mattress and the bed that could cause entrapment. However, this warning statement would not be needed for toddler beds that did not present an entrapment

hazard with the guardrail removed. Thus, the Commission proposes that this warning statement would not be required for toddler beds that meet the performance requirements of sections 5.8.2 (torso entrapment), 6.1 (mattress retention), 6.2 (mattress support system integrity), 6.3 (mattress support system attachment to end structures), 6.4 (mattress support system openings), 6.6 (end structure openings), and 6.7 (partially bounded openings) of ASTM F 1821-09 with the guardrails removed. With this in mind, the Commission proposes two alternative labels that address the entrapment hazard: one for toddler beds with removable guardrails that will not meet these performance requirements with the guardrail removed and one for all other toddler beds.

The entrapment warning for beds with removable guardrails where the beds present an entrapment hazard when the guardrails are removed would read as follows:

⚠️ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.

NEVER use bed with children younger than 15 months.

ALWAYS use supplied guardrails to avoid gaps between mattress and bed.

ONLY use full-size crib mattress of the recommended size.

ALWAYS follow assembly instructions.

The entrapment warning for all other beds would read as follows:

⚠️ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.

NEVER use bed with children younger than 15 months.

ONLY use full-size crib mattress of the recommended size.

ALWAYS follow assembly instructions.

These warnings would use the type-size requirements described in the standard, and the safety alert symbol design is consistent with the latest version of ANSI Z535.4 (2007), *American National Standard for Product Safety Signs and Labels*. The primary differences between these proposed warnings and the relevant portions of the current ASTM warnings are the following:

1. The proposed warnings do not state "ENTRAPMENT HAZARD," which would be analogous to the original "ENTRAPMENT/STRANGULATION HAZARD" statement in the original warning;

2. The proposed warning places greater emphasis on the subpopulation most at risk and the hazard consequences;

3. The proposed warning includes a more explicit description of the mechanism that creates the entrapment hazard; and

4. The proposed warning omits the statement in the label in the voluntary standard concerning the possibility of serious injury or death from not following the warnings.

To the CPSC staff's knowledge, the minimum age recommendation of 15 months for toddler beds is based largely on the increased entrapment potential for children younger than this. Thus, the statement that "[i]nfants have died in toddler beds from entrapment and strangulation," which appears in the original warning, has been carried over, with deletion of the reference to the strangulation hazard, to the proposed entrapment warning label as, "Infants have died in toddler beds from entrapment." Given that this statement already explicitly references "entrapment," the CPSC staff concluded that including an initial "ENTRAPMENT HAZARD" statement would introduce unnecessary redundancy. Furthermore, omitting this statement from the warning allows greater emphasis on the consequences of the hazard (death, in this case) and the subpopulation most at risk of dying from exposure to

the hazard. This greater emphasis on the consequences of the hazard is done by: (1) moving the statement, "Infants have died in toddler beds from entrapment," toward the beginning of the warning message; and (2) reformatting this statement in all-upercase, boldface type. The ASTM F 1821 subcommittee has pointed out that there continue to be incidents with toddler beds involving children younger than the intended age for these products, so emphasizing the at-risk population is important [Ref. 4]. In addition, warnings and persuasion research has found that the degree of seriousness of a perceived threat plays a significant role in whether one complies with a warning, so emphasizing the potential for death would tend to increase the efficacy of a warning [Ref. 4].

The statement in the original warning, "Failure to follow these warnings . . . could result in serious injury or death," is unlikely to have a substantial impact on injuries or warning compliance. The warning already communicates the safety importance of its content via a safety alert symbol, the word "WARNING," and a description of the hazard and its consequences, so telling consumers that not following the warning could result in serious injury or death is redundant at best. In contrast, explicit hazard information in a warning has been found to

lead to higher levels of perceived hazardousness and greater intent to comply with the warning. The original warning message did not specify the source of entrapment or how entrapment might lead to death, and it is unclear whether many consumers could readily and correctly infer this information. The sentence, "Openings in and between bed parts can entrap head and neck of a small child," is intended to remedy this situation by providing a more explicit description of the mechanism that creates the hazard. The Commission also is keeping the warning to follow the assembly instructions because consumer misassembly has been a problem with similar products, such as cribs, and could lead to entrapment.

Section 8.4.4.1 of ASTM F 1821-09 states that additional warning statements shall address the minimum mattress size. The language of this section implies that the precise mattress dimensions should be provided, both in English and metric units. Section 8.3.2 of ASTM F 1821-09, however, already specifies that both the bed and its retail carton shall be clearly and legibly marked with the intended mattress for the bed, including the precise dimensions in both English and metric units. The Human Factors staff, therefore, concluded that repeating precise dimensions within the warning is unnecessary and may, by

making the warning longer, discourage some consumers from reading it. Therefore, proposed § 1217.2(b)(8) would have the warning label include the statement "ONLY use full-size crib mattress of the recommended size" instead of repeating the dimensions of the recommended mattress.

(ii) *Strangulation warning.*

To address the strangulation hazard, the Commission, at proposed § 1217.2(b)(8), is proposing the following warning label for all toddler beds:

⚠ WARNING
STRANGULATION HAZARD
NEVER place bed near windows where cords from blinds or drapes may strangle a child.
NEVER suspend strings over bed.
NEVER place items with a string, cord, or ribbon, such as hood strings or pacifier cords, around a child's neck. These items may catch on bed parts.

Like the proposed entrapment warning labels, this warning would use the type-size requirements described in the standard, and the safety alert symbol design is consistent with ANSI Z535.4-2007, *American National Standard for Product Safety Signs and Labels*. This warning largely reflects all of the information relevant to hazards that was required in the original warnings. A warning statement about not placing items with a string, cord, or ribbon around a child's neck would be more effective with

an additional clarifying sentence, "These items may catch on bed parts." Without this sentence, consumers may find it difficult to infer how the presence of a cord around a child's neck is relevant to the toddler bed or how the cord and bed interact to create the potential for strangulation.

F. Effective Date

The Administrative Procedure Act ("APA") generally requires that the effective date of a rule be at least 30 days after publication of the final rule. 5 U.S.C. § 553(d). To allow time for toddler beds to come into compliance after the final rule is issued, the Commission proposes that the standard would become effective 6 months after publication of a final rule as to products manufactured or imported on or after that date.

G. Paperwork Reduction Act

Sections 8 and 9 of the voluntary standard ASTM F 1821-09 that is being proposed by the Commission as a mandatory standard contain requirements for marking, labeling, and instructional literature that are "information collection requirements" under the Paperwork Reduction Act ("PRA"), 44 U.S.C. 3501-3520. The remainder of this section describes the collection of information

requirements and provides an estimate of the annual burden they would impose [Ref. 5].

The labeling and marking requirements under section 8.1 of ASTM F 1821-09 require each bed and its retail carton to be marked with: (1) the name and place of business of the manufacturer, importer, distributor, or seller (city, state, and mailing address, including zip code and telephone number); (2) a model number or other identifying information such that only articles of identical construction, composition, and dimensions shall bear identical markings; and (3) a code mark or other means that identifies the date of manufacture (at least the month and year) and permits future identification of any given model. The instructional literature required by section 9.1 of ASTM F 1821-09 must, where applicable, include assembly, maintenance, cleaning, folding, and warning information. (Other marking, labeling, and instructional literature requirements in sections 8.3, 8.4, 9.2, and 9.3 of ASTM F 1821-09 are not within the PRA's definition of "collection of information" because the information in those requirements will be "originally supplied by the Federal government to the recipient for the purpose of disclosure to the public" when the final rule is issued. 5 CFR 1120.3(c)(2).

Sections 8.1.1, 8.1.2, and 8.1.3 of ASTM F 1821-09 require information to be placed on both the product and the retail container to identify the manufacturer or importer, product, and production date. This is information that would customarily be collected by manufacturers or importers to assist with production and distribution. In fact, much of the information is already placed on both retail containers and the product itself, because of its informational value, both to the manufacturer or importer and the retailer.

There are 73 known firms supplying toddler beds to the U.S. market. Twenty-nine of the 73 firms are known to already produce labels that comply with sections 8.1.1, 8.1.2, and 8.1.3 of ASTM F 1821-09, and there therefore would be no additional burden on these firms from these requirements. The remaining 44 firms probably already use labels on both their products and their packaging, but may need to make some modifications to their existing labels. The estimated time required to make these modification is about 30 minutes per model. Assuming that each of these firms supplies approximately 10 different models of convertible cribs or toddler beds, the annual burden hours associated with the labels would be:

30 minutes x 44 firms x 10 models per firm = 13,200
minutes or 220 annual hours.

The CPSC staff estimates that the hourly compensation for the time required to create and update labels is \$27.78 (Bureau of Labor Statistics, September 2009, all workers, goods-producing industries, Sales and office, Table 9). Therefore, the estimated annual cost associated with the proposed labeling requirements is approximately \$6,111.60.

Section 9.1 of ASTM F 1821-09 requires that instructions, including modified warning information, be included with the product. This is also a practice that is customary with convertible cribs and toddler beds. These are products that generally require some installation and maintenance instructions, and any products sold without such information would not be able to successfully compete with products that provide this information. Therefore, any burden associated with the mandatory requirements of section 9.1 of ASTM F 1821-09 would consist of (at most) revising the warning labels and reprinting. The CPSC staff estimates that these modifications would take at most 30 minutes per model for each of the 73 known firms supplying the United States market with convertible cribs or toddler beds. Assuming each firm supplies an average of 10 models,

the annual burden hours associated with the warnings would be:

73 firms x 10 models x 30 minutes = 21,900 minutes, or
365 hours.

The CPSC staff estimates that hourly compensation for the time required to modify instruction manuals is \$27.78 (Bureau of Labor Statistics, September 2009, all workers, goods-producing industries, Sales and office, Table 9). Therefore, the estimated annual cost associated with the staff-recommended instruction manual is \$10,139.70.

Based on this analysis, the Commission concludes that the requirements of the proposed toddler bed rule would impose a PRA burden of not more than \$16,251.30 annually.

The Commission has submitted the requirements identified above as collections of information to the Office of Management and Budget ("OMB") for review under section 3507(d) of the PRA. Persons who wish to submit comments on these requirements as they relate to the PRA are requested to fax or email their comments to the Office of Information and Regulatory Affairs of OMB (see **ADDRESSES**). Such comments should be submitted by [insert

date that is 30 days after publication in the FEDERAL REGISTER].

G. Preemption

Section 26(a) of the CPSA, 15 U.S.C. 2075(a), provides that where a "consumer product safety standard under [the CPSA]" is in effect and applies to a product, no State or political subdivision of a State may either establish or continue in effect a requirement dealing with the same risk of injury unless the State requirement is identical to the Federal standard. (Section 26(c) of the CPSA also provides that States or political subdivisions of States may apply to the Commission for an exemption from this preemption under certain circumstances.) Section 104(b) of the CPSIA refers to the rules to be issued under that section as "consumer product safety rules," thus implying that the preemptive effect of section 26(a) of the CPSA would apply. Furthermore, in *Natural Resources Defense Council v. CPSC*, 597 F.Supp. 2d 370 ((S.D. NY 2009), the court held that "[d]esignating the phthalate prohibitions [in section 108 of the CPSIA] as consumer product safety standards brings them within a well established statutory preemption scheme [of section 26(a) of the CPSA]." Therefore, a rule issued under section 104 of the CPSIA will invoke the preemptive

effect of section 26(a) of the CPSA when it becomes effective.

H. Certification

Section 14(a) of the Consumer Product Safety Act ("CPSA") imposes the requirement that products subject to a consumer product safety rule under the CPSA, or to a similar rule, ban, standard, or regulation under any other act enforced by the Commission, must be certified as complying with all applicable CPSC-enforced requirements. 15 U.S.C. 2063(a). Such certification must be based on a test of each product or on a reasonable testing program or, for children's products, on tests on a sufficient number of samples by a third party conformity assessment body accredited by the Commission to test according to the applicable requirements. As discussed above in section G, section 104(b)(1)(B) of the CPSIA refers to standards issued under that section, such as the rule for toddler beds being proposed in this notice, as "consumer product safety standards." Furthermore, the designation as consumer product safety standards subjects such standards to certain sections of the CPSA, such as section 26(a) regarding preemption. By the same reasoning, such standards would also be subject to section 14 of the CPSA.

Therefore, any such standard would be considered to be a consumer product safety rule to which products subject to the rule must be certified.

In addition, the CPSIA is another act enforced by the Commission, and the standards issued under section 104(b)(1)(B) of the CPSIA are similar to consumer product safety rules. For this reason also, toddler beds will need to be tested and certified as complying with the safety standard when it becomes effective. Because toddler beds are children's products, they must be tested by a third-party conformity assessment body accredited by the Commission. In the future, the Commission will issue a notice of requirements to explain how laboratories can become accredited as a third party conformity assessment bodies to test to the new safety standard. (Toddler beds also must comply with all other applicable CPSC requirements, such as the lead content and phthalate content requirements in sections 101 and 108 of the CPSIA, the tracking label requirement in section 14(a)(5) of the CPSA, and the consumer registration form requirements in section 104 of the CPSIA.)

I. Environmental Considerations

The Commission's environmental review regulation at 16 CFR Part 1021 has established categories of actions that normally have little or no potential to affect the human environment and therefore do not require either an environmental assessment or an environmental impact statement. The proposed rule is within the scope of the Commission's regulation, at 16 CFR 1021.5(c)(1), which provides a categorical exclusion for rules to provide design or performance requirements for products. Thus, no environmental assessment or environmental impact statement for this rule is required.

J. Regulatory Flexibility Analysis

The Regulatory Flexibility Act (RFA), 5 USC 601-612, requires agencies to consider the impact of proposed rules on small entities, including small businesses. Section 603 of the RFA requires that CPSC staff prepare an initial regulatory flexibility analysis and make it available to the public for comment when the general notice of proposed rulemaking is published. The initial regulatory flexibility analysis must describe the impact of the proposed rule on small entities and identify any alternatives that may reduce the impact. Specifically, the initial regulatory flexibility analysis must contain:

1. A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;
2. A description of the reasons why action by the agency is being considered;
3. A succinct statement of the objectives of, and legal basis for, the proposed rule;
4. A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities subject to the requirements and the type of professional skills necessary for the preparation of reports or records; and
5. An identification, to the extent possible, of all relevant federal rules that may duplicate, overlap, or conflict with the proposed rule.

In addition, the initial regulatory flexibility analysis must contain a description of any significant alternatives to the proposed rule that would accomplish the stated objectives of the proposed rule while minimizing the economic impact on small entities.

Toddler beds and convertible cribs are typically produced or marketed by juvenile product manufacturers and distributors or by furniture manufacturers and

distributors, some of which have separate divisions for juvenile products. The CPSC's staff believes that there are currently at least 73 known manufacturers or importers that supply toddler beds and/or convertible cribs to the United States market. Approximately 48 suppliers are domestic manufacturers (66 percent), 13 are domestic importers (18 percent), 11 are foreign manufacturers (15 percent), and the remaining firm is a foreign supplier who imports from other countries and exports to the United States. (For sources of information used in this initial regulatory flexibility analysis, see Ref. 5.)

Under Small Business Administration (SBA) guidelines, a manufacturer of toddler beds or convertible cribs is small if it has 500 or fewer employees and an importer is small if it has 100 or fewer employees. Based on these guidelines, 11 of the domestic importers and 34 domestic manufacturers known to be supplying the United States market are small. (Six of these small domestic manufacturers have between 100 and 500 employees.) There are an additional eight domestic manufacturers of unknown size, most of which are likely to be small as well. (In fact, there was sufficient information to include seven of these firms as small in the analysis that follows.) However, there are probably additional unknown small

manufacturers and importers operating in the United States market as well.

The Juvenile Products Manufacturers Association (JPMA), the major United States trade association that represents juvenile product manufacturers and importers, runs a voluntary Certification Program for several juvenile products. Approximately 29 firms that supply toddler beds and/or convertible cribs to the United States market are compliant with the current ASTM voluntary standard (40 percent). (Twenty-six of these firms are JPMA-certified as compliant, while an additional three firms claim compliance. Of the small domestic businesses, 11 manufacturers (32 percent) and 6 importers (55 percent) are JPMA-certified as ASTM-compliant. Additionally, there are two small manufacturers that claim compliance with the ASTM standard that are not part of JPMA's Certification Program.

The most recent United States birth data shows that there are approximately 4.3 million births per year. The vast majority of these babies eventually use cribs for sleeping purposes, although there is some evidence that play yards are becoming a common substitute. In fact, according to a 2005 survey conducted by the American Baby Group (*2006 Baby Products Tracking Study*), 22 percent of new mothers own convertible cribs. Approximately 16

percent of convertible cribs were handed down or purchased second-hand.¹ If these rates hold, this suggests annual convertible crib sales of about 795,000 (0.22 x 0.84 x 4.3 million births per year). Of those consumers with non-convertible cribs, some proportion of them will eventually use toddler beds when their children get older. However, consumers may choose to use a twin or larger bed and use portable bed rails rather than use a separate toddler bed. Assuming that approximately 50 percent elect to use toddler beds and that approximately 50 percent of those buy them new, this would mean that around 839,000 toddler beds are sold per year (0.78 non-convertible cribs x 4.3 million births x 0.5 use toddler beds x 0.5 buy them new).² Adding this to the estimate of convertible cribs yields a total of approximately 1.6 million units (convertible cribs and toddler beds) sold per year that might be affected by the proposed toddler bed standard.

Reason for Agency Action and Legal Basis for the Proposed Rule. Section 104 of the CPSIA requires the CPSC to promulgate a mandatory standard for toddler beds that is

¹ The data on second-hand products for new mothers was not available. Instead, data for new mothers and expectant mothers was combined and broken into first-time mothers and experienced mothers. Data for first-time mothers and experienced mothers was averaged to calculate the approximate percentage that was handed down or purchased second-hand.

² Any per-year estimate for toddler beds will be approximate since when parents make such a purchase for their child is likely to vary.

substantially the same as, or more stringent than, the voluntary standard. The Commission is proposing four additional requirements to the current ASTM standard. The first would assure more structurally sound guardrails. The second is intended to reduce the likelihood of entrapments due to broken slats/spindles. The third would improve the safety of guardrails by adding height requirements. The fourth, modified warnings, is intended to emphasize that deaths in toddler beds have occurred due to entrapments and strangulation. The Commission concludes that the more stringent standard would reduce the risk of future injuries and deaths associated with toddler beds and convertible cribs.

Compliance Requirements of the Proposed Rule. The Commission proposes adopting the voluntary ASTM standard for toddler beds with four additions. Key components of ASTM F 1821 - 09 include:

- Mattress retention requirements intended to control the horizontal position of the mattress and prevent torso entrapments, as well as assure that the mattress does not fall too far below the mattress support when used by a child of the maximum recommended weight (50 lbs);

- Mattress support systems requirements intended to prevent disengagement which might result in a sharp edge or an opening in which a child might become entrapped;
- Requirements for mattress support systems attached to end structures intended to assure that the mattress support system remains attached to the end structures and does not create a hazard, such as sharp edges or openings in which a child might become entrapped;
- Requirements for guardrails intended to prevent openings in guardrails in which children might be trapped; and
- End structures intended to prevent openings in end structures in which children might be trapped.

The voluntary standard also includes: (1) requirements for several features to prevent entrapment and cuts (minimum and maximum opening size, hazardous sharp points or edges, and edges that can scissor, shear, or pinch); (2) torque and tension tests to assure that components cannot be removed; (3) requirements for partially bounded openings; (4) marking and labeling requirements; (5)

requirements for the permanency and adhesion of labels; (6) requirements for instructional literature; and (7) requirements to address corner post extensions, which may catch various children's items and pose a choking hazard.

CPSC staff recommends modifying the existing ASTM standard by adding two new requirements, for guardrail height and slat/spindle strength, and by modifying and expanding already existing structural integrity requirements for guardrails and revising the entrapment/strangulation warnings:

- Guardrail height. The proposed rule would require that guardrails be a minimum height of 5 inches above the manufacturer's recommended sleeping surface. This will help prevent falls.
- Slat/spindle strength. The proposed rule adds a new requirement to test the strength of spindles and slats in guardrails, side rails, and end structures using an 80-lb force.
- Structural integrity for guardrails. In addition to the existing test for guardrail openings, the proposed rule would add a test for the overall stability of guardrails using a 50-lb force while the bed is firmly secured. This additional test is intended to help prevent children from falling

out of bed; it is also calculated to ensure that the guardrails remain intact when children lean against them or attempt to use them to climb into bed.

- Entrapment/strangulation warnings. The proposed rule would modify the existing warnings by adding a more detailed description of mechanisms creating the hazard and separating the entrapment and strangulation messages into two warning labels. This is intended to increase the efficacy of the warning by emphasizing the potential for death for each of the two different mechanisms.

As explained earlier in section F of this preamble, toddler beds and convertible cribs entering commerce would need to meet the new requirements if they are manufactured or imported after 6 months from the date of publication of the final rule. In other words, the standard, if finalized, would not apply retroactively.

The recommended slat/spindle strength requirement may help prevent incidents where slats break and children are either cut, fall through the opening, or become entrapped. This proposed modification to the current voluntary standard could potentially add significant costs to toddler

bed and convertible crib suppliers. Preliminary testing indicates that some toddler beds and convertible cribs currently on the market would meet this requirement with no further modifications, while others would not.

Plastic toddler beds would be exempt from the slat/spindle requirement, because they do not have wooden slats/spindles and have not been associated with the hazards addressed by this requirement. Therefore, we believe that some products will need to be modified to meet the slat/spindle requirement, which is likely to affect at least a few firms.

Suppliers may also need to make product modifications to meet the revised structural integrity requirement and new height requirement for guardrails. No testing has been performed so far that would indicate how many products currently on the market would meet these requirements, but it appears that at least some products will be able to meet the guardrail height requirements. It is possible for firms to eliminate guardrails from their products entirely as a way to address the proposed guardrails requirements if they can comply with the other requirements of the proposed standard without the guardrail in place (guardrails themselves are not required). However, it would be unreasonable to assume that all of the firms whose products

may require modifications can or will take this approach. Therefore, it is expected that at least some products will require modifications to meet these guardrail requirements and that at least a few firms will be affected.

In meeting the slat/spindle strength and guardrail structural integrity requirements, it is possible that firms may improve the quality of materials used to make the slats/spindles or guardrails. (Plastic toddler beds and convertible cribs would not need to make such modifications since they have not been associated with the identified risks from these parts.) For wooden toddler beds and convertible cribs, switching to a stronger material is unlikely to exceed more than a few dollars per unit. For example, using white ash rather than western white pine improves average strength properties by an average of 74 percent

(http://www.woodbin.com/ref/wood/strength_table.htm) while increasing the price of the material by an average of 26 percent (<http://www.willardbrothers.net/ORDER%20FORM.htm>) for a maximum of \$1.55 more for the largest quantity listed. These cost differentials are based on raw lumber costs which would affect firms differently, depending upon how much wood was used in their particular product. Metal toddler beds/convertible cribs are less common than

products made from wood or plastic, but material changes should not be substantially more expensive than for wooden products. Alternatively, firms could undertake product redevelopment to develop compliant toddler beds, which would likely be more expensive than using alternate materials. Therefore, it is likely that at least some firms would select the less expensive option.

Increasing the height of guardrails may help prevent children from falling from the bed. As discussed above, the proposed rule would not require guardrails to be included with toddler beds or convertible cribs, so firms with noncompliant products have the option of eliminating guardrails entirely if their products will comply with the other requirements of the proposed standard with the guardrails removed. Alternatively, they could redesign their product (or the guardrail portion of their product) to make their guardrails higher. If the second option is taken, there will likely be some cost associated with product redevelopment, as well as some increased costs for additional materials.

The remaining requirements, entrapment and strangulation warnings, are expected to have only a minimal impact on current suppliers of toddler beds or convertible cribs. The revised warnings would be only a minor

modification for firms currently complying with the ASTM standard. Even for those firms supplying toddler beds without such a warning or with a warning that differs from the one outlined in the current voluntary standard, the costs associated with printing a revised warning or a completely new warning would be low.

Other Federal Rules. CPSC staff has not identified any federal or state rule that either overlaps or conflicts with the staff's draft proposed rule.

Impact on Small Businesses. There are 73 firms currently known to be marketing toddler beds and/or convertible cribs in the United States. Six are large domestic manufacturers, 1 is a domestic manufacturer of unknown size, 2 are large domestic importers, and 12 are foreign firms. The impact on the remaining 52 small firms—34 firms known to be small domestic manufacturers, 7 firms that are presumed to be small domestic manufacturers, and 11 small domestic importers—is the focus of the remainder of this analysis.

Small Domestic Manufacturers. For the most part, the impact of the proposed standard on small manufacturers will differ based on whether they currently comply with the voluntary ASTM standard. If they do not, as is the case with 28 firms, the impact could be significant. These

firms would likely have to undergo product redevelopment. As explained below, the cost of such an effort for toddler beds and convertible cribs is unknown, but could be substantial for some firms.

Product development costs include product design, development and marketing staff time, product testing, and focus group expenses. These costs can be very high, particularly when there are multiple products, but they can be treated as new product expenses and amortized over time. If a firm deals with multiple products subject to the proposed standard, there may be some economies of scale for some of these development stages that would reduce the marginal costs for each new product being redeveloped. Other one-time costs include the retooling of manufacturing equipment, which could be gradually recouped over the sales of numerous units. There are also expected to be increased costs of production. Producing toddler beds and convertible cribs that have greater structural integrity, stronger slats/spindles, and higher guardrails may require additional raw materials or possibly heavier materials. In addition to increasing the costs of production, this could increase shipping costs as well.

Even if these firms are able to pass their increased costs on to consumers, the impact could still be

considerable. This is because firms manufacturing toddler beds and convertible cribs are not simply competing against other producers of toddler beds and convertible cribs. They also compete against producers of substitute products, firms whose products would not be subject to the proposed standard. Toddler bed producers must compete with producers of twin (or possibly larger) beds that can be used with portable guardrails, while convertible cribs must compete with these same products for larger children and with standard cribs for smaller children.

There is expected to be less of an impact on the 13 firms that are known to comply with the current voluntary standard. At least some of these firms should be able to comply with the new requirements without product modifications other than labeling. The remaining firms may opt to redesign their products as well, which, again, would result in some one-time costs and a possible increase in production costs. It is also possible, however, that they may be able to select a potentially less expensive option to address some of the recommended requirements. A modification in the materials used may be sufficient for many products, and the associated cost is not expected to exceed a few dollars per unit.

There are two manufacturers that do not comply with the current voluntary ASTM standard that would be affected differently by the proposed standard. These firms take already manufactured toddler beds and convertible cribs, decorate them (often with original artwork), and then sell them as a final product. Because these firms do not make the underlying toddler beds and convertible cribs, the impact of the proposed standard on these firms will be the same as that of an importer. These firms would need to find a new supplier of compliant products if their current supplier does not make the necessary modifications. The new products would presumably be of higher quality, as well as more expensive since some of the original manufacturer's production costs (and possibly redevelopment costs) are likely to be passed on to these firms.

The scenario described above assumes that only those firms that are JPMA-certified or claim ASTM compliance will pass the voluntary standard's requirements. This is not necessarily the case. CPSC staff has identified many cases where products not certified by JPMA actually comply with the relevant ASTM standard; however, there is insufficient evidence of this for toddler beds and convertible cribs to quantify this impact. Additionally, the effect of the new and modified requirements may be less substantial than

outlined above to the extent that some products may already comply with foreign standards with some more rigorous requirements. However, there is insufficient information to quantify this effect.

Small Domestic Importers. The majority of small domestic importers (six out of 11) comply with the current voluntary standard. At least some of these firms should not need to make any product modifications (other than labeling) to meet the proposed standard. However, those whose products do require modifications will need to find an alternate supplier if their existing one does not come into compliance. The new products will presumably be of higher quality, as well as more expensive. However, the actual price increase is unknown and likely to vary based upon the degree of modification required. All of the remaining five firms not now in compliance with the ASTM voluntary standard would need to either require their current supplier to make the modifications necessary to comply with the standard or find other suppliers that did comply. Depending on the degree to which their toddler beds and convertible cribs are out of compliance with the voluntary standard, the price increase (as well as the increases in quality and safety) could be relatively high. To the extent that some of these firms may actually comply

with the current voluntary standard or one or more of the new/modified requirements in the proposed standard, the impact of the proposed rule would be lower.

For the most part, the impact of the proposed rule on importers should be smaller than that on manufacturers. Even if importers respond to the rule by discontinuing the import of noncomplying toddler beds and convertible cribs, either by replacing them with a complying product or another juvenile product, deciding to import an alternative product would be a reasonable and realistic way to offset any lost revenue. The one exception would be firms for which convertible cribs or toddler beds and their associated products (*i.e.*, matching furniture) form the core of their product line. For these firms, a substantial price increase could possibly drive them out of business or require them to rebuild their business based on alternative products.

Alternatives. Under section 104 of the CPSIA, the primary alternative that would reduce the impact on small entities is to make the voluntary standard mandatory with no modifications. (This option may not be feasible, given the CPSIA's direction for the Commission to issue more stringent standards if that would further reduce the risk of injury associated with durable nursery products.) For

small domestic manufacturers that already meet the requirements of the voluntary standard, adopting the standard without modifications may reduce their costs relative to the proposed rule, but only marginally. Similarly, limiting the requirements of a final rule to those now in the voluntary standard would probably have little beneficial impact on small manufacturers that do not currently meet the requirements of the voluntary standard. This is because, for these firms, most of the cost increases would be associated with meeting the requirements of the current voluntary standard, rather than the changes associated with the proposed rule. The difference for importers, whether compliant with the voluntary standard or not, is also likely to be minimal.

Conclusion. The proposed rule could have a significant impact on a substantial number of small entities. Even if *all* the small firms that are JPMA-certified as compliant with ASTM's voluntary standard did not require any changes other than labeling to comply with the proposed standard, there would still be 58 percent (30 out of 52 firms) that would probably need to redevelop their products to comply. This would typically need to be done for multiple products for each firm. (To the extent that some of the products not certified by JPMA may still

comply, the impact will be reduced.) Firms supplying products that already comply with the voluntary standard may not need to make any product modifications (other than labeling) to meet the proposed rule, but this applies to only 42 percent of the known small firms. Some of these firms, and basically all of the other small firms, will need to make at least some modifications to their toddler beds and convertible cribs to comply with the proposed rule. The extent of these costs is unknown, but since product redevelopment would likely be necessary in many cases, it is possible that the costs could be large and have the potential to reduce firms' ability to compete with substitute products.

Nineteen small businesses are believed to have product lines consisting entirely or primarily of toddler beds, convertible cribs, and related products (such as accompanying furniture). These firms may be affected disproportionately by the proposed rule. If the cost of developing (or importing) a compliant product proves to be a barrier for these firms, the loss of toddler beds and convertible cribs as a product category could be significant and may not be easily mitigated by the sale of other juvenile products.

K. Request for Comments

All interested persons are invited to submit their comments to the Commission on any aspect of the proposed rule. Comments should be submitted in accordance with the instructions in the ADDRESSES section at the beginning of this notice.

L. References

1. CPSC staff memorandum, from Celestine T. Kiss, Project Manager, Division of Human Factors, Directorate for Engineering Sciences, and Robert J. Howell, Assistant Executive Director, Office of Hazard Identification and Reduction, "Staff's Draft Proposed Rule for toddler Beds," March __, 2010, with Tabs A-D.

2. CPSC staff memorandum, from Risana T. Chowdhury, Division of Hazard Analysis, to Celestine T. Kiss, Division of Human Factors, Directorate for Engineering Sciences, "Toddler Beds-Related Deaths, Injuries and Potential Injuries, and NEISS Injury Estimates; 2005 - Present," January 28, 2010 (Tab A to Ref. 1).

3. CPSC staff memorandum, from Jacob J. Miller, Division of Mechanical Engineering, Directorate for Engineering Sciences, to Celestine T. Kiss, Project Manager, Division of Human Factors, Directorate for

Engineering Sciences, "Proposed Changes to ASTM F 1821-09, Standard consumer Safety Specification for Toddler Beds, for Incorporation in Staff's Draft Proposed Rule," February 23, 2010 (Tab B to Ref. 1).

4. CPSC staff memorandum, from Timothy P. Smith, Engineering Psychologist, Division of Human Factors, Directorate for engineering Sciences, to Celestine T. Kiss, Project Manager, Division of Human Factors, Directorate for Engineering Sciences, "Warning Statements for Toddler Beds (CPSIA Section 104)," March __, 2010 (Tab C to Ref. 1).

5. CPSC staff memorandum, from Jill L. Jenkins, Ph.D., Economist, Directorate for Economic Analysis, to Celestine T. Kiss, Project Manager for Toddler Beds, Division of Human Factors, Directorate for Engineering Sciences, "Initial Regulatory Flexibility Analysis of Proposed Standard for Toddler Beds," February 18, 2010 (Tab D to Ref. 1).

List of Subjects in 16 CFR Part 1120

Consumer protection, Infants and children,
Incorporation by reference, Law enforcement, Safety,
Toddler beds

For the reasons stated above, and under the authority of 5 U.S.C. 553, and sections 3 and 104 of Public Law 110-314, 122 Stat. 3016 (August 14, 2008), the Consumer Product Safety Commission proposes to issue a new 16 CFR part 1217 as follows:

PART 1217—SAFETY STANDARD FOR TODDLER BEDS

Sec.

1217.1 Scope, application, and effective date.

1217.2 Requirements for toddler beds.

Authority: Sections 3 and 104 of Pub. L. 110-314, 122 Stat. 3016 (August 14, 2008).

§ 1217.1 Scope, application, and effective date.

This part 1217 establishes a consumer product safety standard for toddler beds manufactured or imported after 6 months after publication of the final rule in the FEDERAL REGISTER.

§ 1217.2 Requirements for toddler beds.

(a) Except as provided in paragraph (b) of this section, each toddler bed as defined in ASTM F 1821-09,

Standard Consumer Safety Specification for Toddler Beds, approved April 1, 2009, shall comply with all applicable provisions of ASTM F 1821-09, as that standard is amended by this part 1217. The Director of the Federal Register approves this incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. You may obtain a copy of this ASTM standard from ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959 USA, phone: 610-832-9585; <http://www.astm.org/>. You may inspect copies at the Office of the Secretary, U.S. Consumer Product Safety Commission, Room 820, 4330 East West Highway, Bethesda, MD 20814, telephone 301-504-7923, or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) The following provisions replace, or are added to, the indicated sections of the ASTM 1821-09 standard.

(1) Redesignate previous section 6.5 as section 6.5.1 and delete the introductory heading "Guardrails--"

(2) Add a new section 6.5 to read as follows:

"6.5 *Guardrails*:"

(3) Add a new section 6.5.2 to read as follows:

"6.5.2 The upper edge of the guardrails shall be at least 5 in. (130 mm) above the sleeping surface when a mattress of a thickness that is the maximum specified by the manufacturer's instructions is used."

(4) Add a new section 6.8 to read as follows:

"6.8 *Structural Integrity of Guardrails*—After testing in accordance with 7.9, there shall be none of the hazardous conditions described in Section 5."

(5) Add new sections 6.9 and 6.9.1 to read as follows:

"6.9 *Slat/Spindle Strength*—Toddler beds that contain wooden or metal slats or spindles shall meet the performance requirements outlined in section 6.9.1.

"6.9.1 After testing in accordance with the procedure in 7.10, there shall be no slat or spindle breakage or separation of a slat or spindle from the guardrails, side rails, or end structures."

(6) Add new sections 7.9 and 7.9.1 to read as follows:

"7.9 *Test Method for Guardrail Structural Integrity*:

"7.9.1 Firmly secure the toddler bed on a stationary flat surface using clamps. Gradually apply 50 lbf to the uppermost horizontal part of the mattress side of the guardrail in a direction perpendicular to the plane of the

rail. The force should be applied in the center along the length of the rail and then repeated with the force applied directly over each of the outermost legs of the guardrail. The force should be applied in the direction away from the mattress within a period of 5 s and maintained for an additional 10 s."

(7) Add new sections 7.10, 7.10.1, 7.10.2, 7.10.3, 7.10.4, and 7.10.5 to read as follows:

"7.10 *Slat/Spindle Testing for Guardrails, Side Rails, and End Structures:*

"7.10.1 The spindle/slat static load test shall be performed for all slats and spindles with the spindle/slat assemblies removed from the bed and supported only on the rail corners through a contact area not more than 3 square inches when measured parallel to the longitudinal axis of the end of the rail. Besides the corners, the upper and lower horizontal rails of both linear and contoured shall be free to deflect under the applied force.

"7.10.2 Gradually, over a period of not less than 2 s or greater than 5 s, apply the force specified in 7.10.3 or 7.10.4 at the midpoint between the top and bottom of the spindle/slat being tested. This force shall be applied through a contact area large enough to not cause visible indentation or cutting of the spindle/slat, but not wider

than 1 in. (2.54 cm) when measured parallel to the longitudinal axis of the spindle/slat. This weight shall be maintained for 30 seconds.

"7.10.3 Test, according to 7.10.2, 25% (or the next highest percentage if 4 does not divide evenly into the total number) of all spindles/slats with a force of 80 lb. Spindles/slats that offer the least resistance to bending based upon their geometry shall be selected to be tested within this grouping of 25%, except that adjacent spindles/slats shall not be tested per 7.10.2. Place an identifying mark on all tested spindles/slats.

"7.10.4 Upon completion of the test described in 7.10.2 and 7.10.3, gradually apply, over a period of not less than 2 s or greater than 5 s, 60 lbf (266.9 N) at the midpoint between the top and bottom of all spindles/slats not previously tested under 7.10.2 and 7.10.3. This force shall be applied through a contact area large enough to not cause visible indentation or cutting of the spindle/slat, but not wider than 1 in. (2.54 cm) when measured parallel to the longitudinal axis of the spindle/slat. This force shall be maintained for 30 s.

"7.10.5 End vertical rails that are joined between the slat assembly top and bottom rails are not considered slats and do not require testing under 7.10."

(8) Replace section 8.4.3, including the warning label, and sections 8.4.4 through 8.4.4.5 with the following sections 8.4.3, 8.4.4, and 8.4.5 to read as follows:

"8.4.3 Toddler beds that meet the performance requirements of sections 5.8.2 (torso entrapment), 6.1 (mattress retention), 6.2 (mattress support system integrity), 6.3 (mattress support system attachment to end structures), 6.4 (mattress support system openings), 6.6 (end structure openings), and 6.7 (partially bounded openings) with the guardrails removed may bear the following label, exactly as depicted, instead of the label required by section 8.4.4:

⚠WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.

Openings in and between bed parts can entrap head and neck of a small child.

NEVER use bed with children younger than 15 months.

ONLY use full-size crib mattress of the recommended size.

ALWAYS follow assembly instructions.

"8.4.4 All toddler beds that do not bear the label allowed for certain toddler beds by section 8.4.3, shall bear the following label, exactly as depicted:

⚠ WARNING

INFANTS HAVE DIED IN TODDLER BEDS FROM ENTRAPMENT.
Openings in and between bed parts can entrap head and neck of a small child.
NEVER use bed with children younger than 15 months.
ALWAYS use supplied guardrails to avoid gaps between mattress and bed.
ONLY use full-size crib mattress of the recommended size.
ALWAYS follow assembly instructions.

"8.4.5 In addition to the label allowed by section 8.4.3 or required by section 8.4.4, all toddler beds shall bear the following label, exactly as depicted:

⚠ WARNING

STRANGULATION HAZARD

NEVER place bed near windows where cords from blinds or drapes may strangle a child.

NEVER suspend strings over bed.

NEVER place items with a string, cord, or ribbon, such as hood strings or pacifier cords, around a child's neck. These items may catch on bed parts.

Dated: _____

Todd Stevenson, Secretary
U.S. Consumer Product Safety Commission