Tab C

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

DATE: December 18, 1998

MEMORANDUM

TO: Margaret Neily
Project Manager
Directorate for Engineering Sciences

THROUGH: Mary Ann Danello, Ph.D., AED
Directorate for Epidemiology and Health Sciences
Susan W. Ahmed, Ph.D., Director, EHHA

FROM: Michael A. Greene, Ph.D., EHHA

SUBJECT: Update to the Proposed Technical Changes to Sleepwear Standard Briefing Package

This material is meant to update the information in the report entitled "Clothing-Related Thermal Burn Injuries in Children under 15 Years Old," by C. Craig Morris. Section III of the report contains a summary of in-depth investigations (IDIs) covering incidents from 1993 to 1997. This report was in the April 1998 briefing package. A copy of the report begins on the next page.

In connection with this update for the briefing package, we reviewed seven additional IDIs describing incidents that occurred during calendar 1998. None of the incidents involved garments listed as nightwear (product code 1644) or worn as sleepwear, according to the IDIs.

Clothing-Related Thermal Burns in Children under 15 Years Old

March 1998

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U.S. Consumer Product Safety Commission
Directorate for Epidemiology and Health Sciences
Division of Hazard Analysis
4330 East West Highway
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Executive Summary

A 1994 U. S. Consumer Product Safety Commission (CPSC) report described clothing-related thermal burn injuries and deaths among children under 15 years old from 1970 to 1994.[1] The present report describes such injuries and deaths during the period from 1970 to 1997. Data sources include the CPSC's National Electronic Injury Surveillance System (NEISS), the National Center for Health Statistics' E-code mortality file, and population data files from the U.S. Bureau of the Census.

Clothing-related thermal burn fatalities declined sharply during the 1970's. Among children 0-14 years old, 60 deaths occurred in 1970, 15 in 1975, 7 in 1980, and 6 or less each year thereafter through 1995. Similar declines occurred in all age groups, but more deaths occurred among older people. Among adults 65 and over, 455 deaths occurred in 1970, 280 in 1975, 215 in 1980, 164 in 1985, 117 in 1990, and 123 or fewer each year thereafter through 1995.

NEISS data on reported hospital emergency room-treated injuries among children under 15 years old revealed no annual trend in clothing-related thermal burn injuries from 1980 to 1997. Males were more likely than females to be involved in about 60% of these injuries. None of the reported NEISS injuries to children under 15 years old involved children less than 2 years old, 2% involved children 2 years old, and 98% were about evenly distributed across the ages from 3 to 14 years.

CPSC in-depth investigations from 1993 to 1997 revealed that none of the 32 thermal-burn incidents involving garments used as sleepwear involved "stay of enforcement" garments or garments exempt from current sleepwear flammability standards (certain tight-fitting garments and garments sized for infants 9 months old and under). These investigations included one consumer-reported incident involving a 15-month-old victim wearing traditional flame resistant sleepwear. These investigations also revealed that the most frequent and severe sleepwear-related thermal burn injuries involved oversize, loose-fitting T-shirts.

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[1] *Injury Data Related to the Children's Sleepwear Standards*, T. L. Kissinger, CPSC, 1995.

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I. Clothing-Related Thermal Burn Injuries

A. Method

The U.S. Consumer Product Safety Commission's (CPSC's) National Electronic Injury Surveillance System (NEISS) collects data on hospital emergency room-treated injuries via a probability sample of hospitals across the United States and its territories.[2] A 1995 CPSC report presented NEISS estimates of clothing-related thermal burn injuries to children under fifteen years of age for the calendar years 1980 through 1994. The case selection criteria included product codes 1644 (Nightwear), 1645 (Daywear), 1658 (Unspecified Clothing), or 1677 (Other Clothing), diagnoses 51 (Thermal Burns) or 47 (Unspecified Burns), and age under 15 years old. NEISS comments were reviewed to eliminate cases not involving the burning of clothing while worn by the victim. Such cases included, for example, burns while ironing clothes. In the present report, previously reported estimates[1] for the years 1980 to 1994 are presented along with estimates for the years 1995 to 1997.

B. Annual Trends

Estimates of reported clothing-related thermal burn injuries to children under 15 years of age for the calendar years 1980 to 1997 appear in **Figure 1.** More injuries reportedly involved Daywear than any other type of clothing for every year from 1980 to 1997. None of the four types of clothing or the total showed an increasing or decreasing linear annual trend

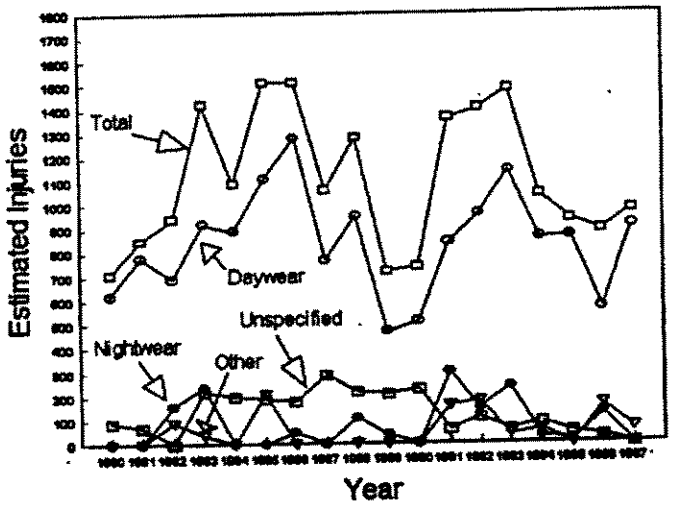

Figure 1. Clothing-Related Thermal Burn Injuries in Children under 15 Years Old from 1980 to 1997. Source: National Electronic Injury Surveillance System.

[2] *The NEISS Sample (Design and Implementation)*, E. Kessler, CPSC, 1995.

in injuries. As shown in **Table 1**, correlations with year were nonsignificant for Total clothing-related thermal burn injuries (r = .03), Daywear-related injuries (r = .03), Nightwear-related injuries (r = .12), Other clothing-related injuries (r = .27), and Unspecified clothing-related injuries (r = -.34).[3]

Table 1

Correlation Matrix for Year and Clothing-Related Thermal Burn Injuries

	Total	Daywear	Nightwear	Other	Unspecified
Year	.03	.03	.12	.27	-.34
Total		.87	.52	.40	.16
Daywear			.19	.15	.02
Nightwear				.40	-.24
Other					-.34

Source: U.S. Consumer Product Safety Commission, 1998.

Table 2 pools estimates for each type of clothing and the total across the entire 18-year period from 1980 to 1997. The estimated annual average number of reported clothing-related thermal burn injuries was 840 (76.0%) for Daywear, 80 (7.4%) for Nightwear, 60 (5.1%) for Other clothing, and 130 (11.6%) for Unspecified clothing.

Table 2

Estimated Clothing-Related Thermal Burns from 1980 through 1997

Type	Annual Average	18-Year Total	Percent of Total
Daywear	840	15,130	76.0
Nightwear	80	1,470	7.4
Other	60	1,010	5.1
Unspecified	130	2,300	11.6
Total	1,110	19,920	100.0

Source: National Electronic Injury Surveillance System, U.S. Consumer Product Safety Commission, 1998. Note: details may not sum to total due to rounding.

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[3] None of these Pearson product moment correlation coefficients approached the critical value $|r| = .4683$ required for significance in a two-tailed t test with $DF = 16$ and $\alpha = .05$.

The 95% confidence interval for the annual estimate of 1,110 total injuries is approximately 1,110 ± 550, based on a generalized relative sampling error[4] of 0.25. Smaller NEISS estimates are associated with much larger relative sampling errors, so confidence intervals for smaller NEISS estimates are not reported here.

C. Gender, Age, Treatment Disposition

Table 3 gives pooled NEISS estimates for 1980 through 1997 by gender and type of clothing (Daywear or Nightwear). Overall, about 50% more injuries involved males (61%) than females (39%). However, there was a crossing interaction of gender and type of clothing: Daywear-related injuries involved more males (63%) than females (37%), but Nightwear-related injuries involved more females (62%) than males (38%). The interaction must be interpreted cautiously because of the small number of cases involving Nightwear.

Table 3

Estimated Daywear- and Nightwear-Related Thermal Burns
from 1980 through 1997 by Victim Gender

	Daywear	Nightwear	Total
Male	9,650	580	10,230
Female	5,660	940	6,600

Source: National Electronic Injury Surveillance System, U.S. Consumer Product Safety Commission, 1998. Note: details may not sum to total due to rounding.

Table 4 gives pooled NEISS estimates of clothing-related thermal burns for 1995 through 1997 by treatment disposition and victim gender. Estimates are combined for all four types of clothing reports (Daywear, Nightwear, Other, Unspecifed). About 24% of the total estimated number of injured victims were hospitalized or treated and transferred to another facility; the remaining 76% were treated and released.

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[4] *National Electronic Injury Surveillance System (NEISS) Estimated Generalized Relative Sampling Errors*, Kessler, E. and Schroeder, T., CPSC, 1997. The authors give formulas for both the generalized relative sampling error and an associated 95% confidence interval defined as $E \pm M$, where E is the NEISS estimate, $M = 1.96\ E/(1.70282\ \mathrm{LN}(E) - 7.94958)$, and $\mathrm{LN}(E)$ is the natural log of the estimate E. The formula, based on 1996 estimates, provides an excellent approximation for the years 1990 to 1996.

Table 4

Estimated Clothing-Related Thermal Burns from 1995 through 1997 by Treatment Disposition and Victim Gender

	Treated & Released	Treated & Transferred	Hospitalized	Total
Male	1,460	200	320	1,980
Female	670	110	30	820
Total	2,130	310	360	2,800

Source: National Electronic Injury Surveillance System, U.S. Consumer Product Safety Commission, 1998. Note: details may not sum to total due to rounding.

Table 5 gives pooled NEISS estimates of clothing-related thermal burns for the years 1995 through 1997 by victim age. Estimates are combined for all four types of clothing reports (Daywear, Nightwear, Other, Unspecifed). Estimated injuries were fairly evenly distributed across the ages from three to fourteen years old. Two percent of the estimated injuries involved victims two years old, and there were no reported injuries involving victims under two years old.

Table 5

Estimated Clothing-Related Thermal Burns from 1995 through 1997 by Victim Age

Age (years)	Estimated Number	Percent
1-2	70	2
3-4	420	15
5-6	660	23
7-8	300	11
9-10	460	16
11-12	290	10
13-14	620	22
Total	2,800	100

Source: National Electronic Injury Surveillance System, U.S. Consumer Product Safety Commission, 1998. Note: details may not sum to total due to rounding.

II. Clothing-Related Thermal Burn Fatalities

A. Method

The National Center for Health Statistics (NCHS) compiles data on deaths in the United States. These deaths are classified in accordance with the International Classification of Diseases (ICDA). E-code 893 in the Ninth Revision of the ICDA denotes a death due to clothing-related thermal burns. A 1995 CPSC report on clothing-related thermal burn injuries[1] presented the number of deaths classified under E893 by age group for the 1970-1991 period. In addition, population data from the Bureau of the Census were used to estimate fatality rates by age group for the same period. The present report provides comparable estimates for the period 1992-1995 and presents them with estimates for 1970-1991 from the 1995 CPSC report.

B. Annual Trends

Figure 2 gives data (E-code 893) from 1970 to 1995 for children 0-4 and 5-14 years old. Clothing-related thermal burn fatalities declined sharply during the 1970's. Among children 0-14 years old, 60 deaths occurred in 1970, 15 in 1975, 7 in 1980, and 6 or less each year thereafter through 1995. As shown in **Table 6**, similar declines occurred in all age groups, but more deaths occurred among older people. Among adults 65 and over, 455 deaths occurred in 1970, 280 in 1975, 215 in 1980, 164 in 1985, 117 in 1990, and 123 or fewer each year thereafter through 1995. Table 6 gives fatality data for the age groups 0-4 years, 5-14 years, 15-24 years, 25-44 years, 45-64 years, and 65+ years. To assess the significance of the negative nonlinear trends from 1970 to 1995 in Table 6 and Figure 2, a logarithmic transformation was performed on year.[5] Product moment correlations of deaths with log-year were all strong and significant: -.90 for 0-4 years, -.92 for 5-14 years, -.88 for 15-24 years, -.92 for 25-44 years, -.98 for 45-64 years, -.99 for 65+ years, and -.99 for all ages combined.[6] These strong negative correlations indicate that decreasing logarithmic functions accurately describe the downward trends in fatalities in Figure 2 and Table 6. In other words, the decline in deaths was steepest in the early 1970's, less steep in the later 1970's, and flattened out in the 1980's.

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[5] The natural-log transformation was LYear = log(Year-1969). Graphic plots of deaths against log-transformed year yielded linear functions, with Pearson product moment correlations approaching -1.00.

[6] The absolute value of the Pearson product moment correlation coefficient must exceed $|r| = .3809$ for statistical significance in a two-tailed t test with $DF = 25$ and $\alpha = .05$.

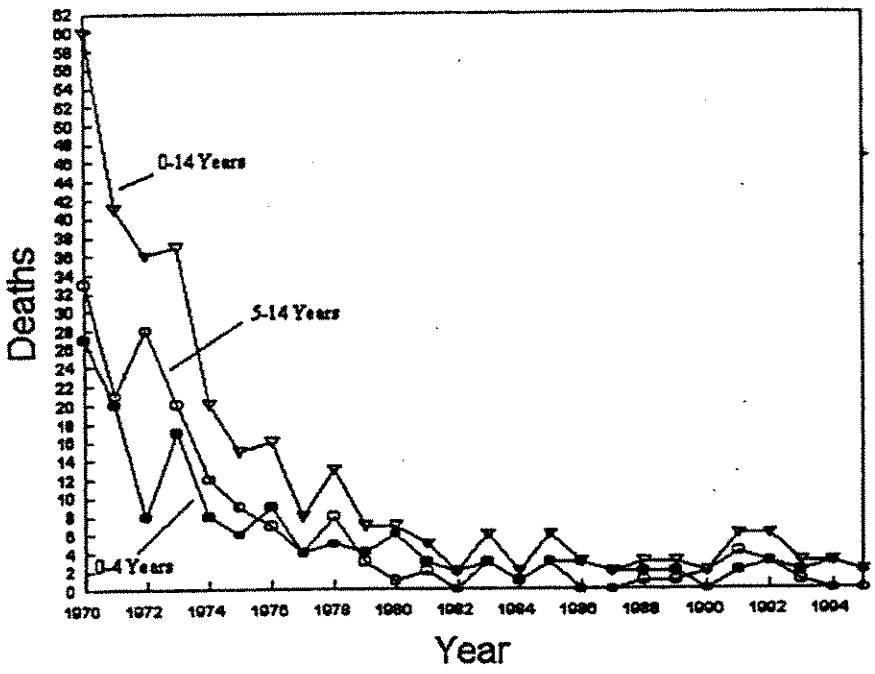


Figure 2. Clothing-Related Thermal Burn Deaths in Children under 15 Years Old from 1970 to 1995. Source: National Center for Health Statistics E-code File.

Table 6. *Clothing-Related Thermal Burn Fatalities from 1970 through 1995 (E-code 893)*

Year	Age in Years 0-4	5-14	15-24	25-44	45-64	65+	Total
1995	2	0	3	10	25	110	150
1994	3	0	3	12	24	108	150
1993	2	1	1	5	26	123	158
1992	3	3	1	15	27	104	153
1991	2	4	2	14	22	118	162
1990	0	2	2	6	34	117	161
1989	2	1	4	23	33	158	221
1988	2	1	0	13	30	159	205
1987	2	0	1	5	26	166	200
1986	3	0	2	11	24	139	179
1985	3	3	5	10	49	164	234
1984	1	1	5	12	40	165	224
1983	3	3	5	11	53	195	270
1982	2	0	7	18	38	195	260
1981	3	2	4	14	53	229	305
1980	6	1	4	18	66	215	310
1979	4	3	7	17	54	205	290
1978	5	8	5	12	62	232	324
1977	4	4	6	24	73	265	376
1976	9	7	4	27	89	289	425
1975	6	9	14	23	97	280	429
1974	8	12	8	24	104	289	445
1973	17	20	7	35	117	321	517
1972	8	28	12	34	104	356	542
1971	20	21	13	42	161	398	655
1970	27	33	15	50	180	455	760
Total	137	163	132	443	1,509	5,110	7,494

Source: E-Code file, National Center for Health Statistics, and 1998.
Note: details may not sum to total due to rounding.

Table 7 gives fatality rates (deaths per million people) derived from data in Table 6 and annual population data from the Bureau of the Census. Among children 0-4 years old, the fatality rate was 1.57 in 1970, 0.37 in 1975, 0.37 in 1980, and 0.18 or less each year thereafter through 1995. Among adults 65 and over, the fatality rate was 22.78 in 1970, 12.34 in 1975, 8.41 in 1980, 5.77 in 1985, 3.76 in 1990, and 3.75 or fewer each year thereafter through 1995.

Table 7. *Clothing-Related Thermal Burn Fatalities per Million People from 1970 through 1995 (E-code 893)*

Year	Age in Years 0-4	5-14	15-24	25-44	45-64	65+	Total
1995	0.10	0.00	0.08	0.12	0.48	3.28	0.57
1994	0.15	0.00	0.08	0.14	0.47	3.26	0.58
1993	0.10	0.03	0.03	0.06	0.52	3.75	0.61
1992	0.15	0.08	0.03	0.18	0.56	3.22	0.60
1991	0.10	0.11	0.05	0.17	0.47	3.72	0.64
1990	0.00	0.06	0.05	0.07	0.74	3.76	0.65
1989	0.11	0.03	0.11	0.29	0.72	5.15	0.90
1988	0.11	0.03	0.00	0.17	0.66	5.28	0.84
1987	0.11	0.00	0.03	0.06	0.58	5.60	0.83
1986	0.17	0.00	0.05	0.15	0.54	4.79	0.75
1985	0.17	0.09	0.13	0.14	1.10	5.77	0.98
1984	0.06	0.03	0.12	0.17	0.90	5.92	0.95
1983	0.17	0.09	0.12	0.16	1.19	7.13	1.15
1982	0.12	0.00	0.17	0.27	0.85	7.28	1.12
1981	0.18	0.06	0.09	0.21	1.19	8.73	1.33
1980	0.37	0.03	0.09	0.29	1.48	8.41	1.37
1979	0.25	0.08	0.16	0.28	1.22	8.16	1.29
1978	0.32	0.22	0.12	0.20	1.40	9.47	1.46
1977	0.26	0.11	0.14	0.42	1.65	11.09	1.71
1976	0.58	0.19	0.10	0.49	2.02	12.41	1.95
1975	0.37	0.24	0.35	0.43	2.21	12.34	1.99
1974	0.49	0.31	0.20	0.45	2.39	12.10	2.09
1973	1.01	0.51	0.18	0.68	2.71	14.91	2.45
1972	0.47	0.70	0.32	0.68	2.43	16.94	2.59
1971	1.16	0.52	0.35	0.86	3.79	19.36	3.17
1970	1.57	0.81	0.42	1.04	4.30	22.78	3.74

Source: derived by U.S. Consumer Product Safety Commission using mortality data from the National Center for Health Statistics and population data from the Bureau of the Census, 1998. Note: details may not sum to total due to rounding.

To assess the significance of the nonlinear negative trends from 1970 to 1995 in Table 7, a logarithmic transformation was performed on year (see note 4). Product moment correlations of risk with log-year were all strong and significant: -.91 for 0-4 years, -.92 for 5-14 years, -.89 for 15-24 years, -.96 for 25-44 years, -.98 for 45-64 years, -1.00 for 65+ years, and -1.00 for all ages combined (see note 5 about significance test). These strong negative correlations indicate that decreasing logarithmic functions accurately describe the trends in risk shown in Table 7. In other words, the decline in risk was steepest in the early 1970's, less

steep in the later 1970's, and gradually flattened out in the 1980's.

III. Hazard Patterns in Children's Sleepwear-Related Thermal Burn Incidents

CPSC's in-depth investigations (INDP) file revealed 131 investigations of clothing-related thermal burn incidents by CPSC staff from 1993 to 1997. Among these 131 incidents, CPSC staff identified 32 cases involving children wearing sleepwear or garments used as sleepwear. Of the 32 sleepwear-related cases, 21 involved males and 11 involved females. The ages of the victims ranged from 15 months to 11 years, with a median of 6.0 years and average of 6.1 years. The incident involving a 15-month-old victim was reported to CPSC by a consumer complaint, not through NEISS. The 15-month-old victim was wearing a traditional flame resistant,100% polyester "blanket sleeper" that was ignited by a spark from a fireplace. The 32 cases were classified into three categories: oversize or loose-fitting T-shirts (n = 23), traditional (flame resistant) sleepwear (n = 5), and "unusual" garments (n = 4). The "unusual" sleepwear garments (and associated injuries) included a tight-fitting T-shirt too small for the child (minor burns), loose-fitting cotton pajamas (20% body burns and required skin grafts), an adult gown (first and second degree burns), and an adult nightshirt (10 days hospitalization). The loose fitting pajamas appeared to be noncomplying sleepwear: although the mother described the garment as "loose fitting pajamas," the persistent burning of the garment (as described by the mother) is inconsistent with the flame resistant property of complying sleepwear. The in-depth investigations revealed that none of the 32 incidents involved "stay of enforcement" garments or garments exempt from current sleepwear flammability standards (certain tight-fitting garments and garments sized for infants 9 months old and under).

Seven sources of ignition were identified in the 32 cases: cigarette lighters (n = 14), stoves (n = 8), matches (n = 3), candles (n = 2), space heaters (n = 2), fireplaces (n = 2), and a halogen light (n = 1). The burn injuries in these cases were usually severe: 13 of the 23 T-shirt-related incidents resulted in hospitalization and 13 involved 3rd-degree burns; 2 of the 4 unusual garment incidents resulted in 3rd-degree burns and hospitalization; and none of the 5 flame resistant sleepwear incidents resulted in hospitalization, although 2 of these cases reportedly did involve localized 3rd-degree burns. Thus, of the 32 incidents,15 resulted in hospitalization and 17 resulted in 3rd-degree burns.

IV. Conclusion

A 1994 U. S. Consumer Product Safety Commission (CPSC) report described clothing-related thermal burn injuries and deaths among children under 15 years old from 1970 to 1994. The present report describes such injuries and deaths during the period from 1970 to 1997. Data sources include the CPSC's National Electronic Injury Surveillance System (NEISS), the National Center for Health Statistics' E-code mortality file, and population data files from the U.S. Bureau of the Census.

Clothing-related thermal burn fatalities declined sharply during the 1970's. Among children 0-14 years old, 60 deaths occurred in 1970, 15 in 1975, 7 in 1980, and 6 or less each year thereafter through 1995. Similar declines occurred in all age groups, but more deaths occurred among older people. Among adults 65 and over, 455 deaths occurred in 1970, 280 in 1975, 215 in 1980, 164 in 1985, 117 in 1990, and 123 or fewer each year thereafter through 1995.

NEISS data on reported hospital emergency room-treated injuries among children under 15 years old revealed no annual trend in clothing-related thermal burn injuries from 1980 to 1997. Males were more likely than females to be involved in about 60% of these injuries. None of the reported NEISS injuries to children under 15 years old involved children less than 2 years old, 2% involved children 2 years old, and 98% were about evenly distributed across the ages from 3 to 14 years.

CPSC in-depth investigations from 1993 to 1997 revealed that none of the 32 thermal-burn incidents involving garments used as sleepwear involved "stay of enforcement" garments or garments exempt from current sleepwear flammability standards (certain tight-fitting garments and garments sized for infants 9 months old and under). These investigations included one consumer-reported incident involving a 15-month-old victim wearing traditional flame resistant sleepwear. These investigations also revealed that the most frequent and severe sleepwear-related thermal burn injuries involved oversize, loose-fitting T-shirts.

Tab D

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

MEMORANDUM

DATE: December 10, 1998

TO : Margaret L. Neily, ES
Project Manager, Children's Sleepwear

Through: Warren J. Prunella, AED, EC WJP

FROM : Terrance R. Karels, EC TRK

SUBJECT: Sleepwear Market

The American Apparel Manufacturers Association (AAMA) continues to express concern over the dimensions required of exempted tight-fitting children's sleepwear. The AAMA's concerns center on difficulties in production to these dimensions, and state that consumers will not accept the products because the sleepwear would be too tight for comfort.

To conduct a preliminary evaluation of consumer acceptance of the exempted sleepwear, we contacted six manufacturers. Each was optimistic about the market for these products. Further, the manufacturers estimate that tight- fitting cotton sleepwear accounts for 20-25 percent (or more) of total children's sleepwear sales.

These manufacturers also stated that there were initial design and production difficulties in manufacturing to these dimensions. They reported that the time frame needed for initial designs and prototype testing was perhaps 6 to 9 months. Design difficulties were most often addressed through the substitution of fabrics with differing stretch characteristics. The firms also reported that other firms entering the market for these garments are adapting the styles and fabrics of firms which are already producing and selling garments. They stated that there were perhaps 5 firms producing exempted garments last year, and that currently there are "1-2 dozen or more."

The AAMA was also concerned about returns of products from dissatisfied consumers. The manufacturers we contacted reported "little or no" returns. We also contacted the two largest retailers of children's sleepwear. These firms stated that producers would not necessarily be aware of customer returns for months, until retailers charged-off returned items from their payments to manufacturers. The retailers stated that these sleepwear returns were at about 5 percent, which they described as a relatively high level. However, one firm, which has produced exempted children's sleepwear for over a year reported "negligible" returns.

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

MEMORANDUM

DATE: December 10, 1998

TO : Margaret L. Neily, ES
Project Manager, Children's Sleepwear

Through: Warren J. Prunella, AED, EC WJP.

FROM : Terrance R. Karels, EC TRK

SUBJECT: Revisions to the Children's Sleepwear Amendments

The Commission is considering revisions to the standards issued under the Flammable Fabrics Act (FFA) for children's sleepwear. The revisions are technical in nature, clarifying where garments are measured (i.e., upper arm, seat, and thigh) to be in compliance with the regulations.

The revisions change the location on the garments where the measurements are taken and correct the definition of "tight fitting garments." The upper arm would be measured further down the arm, rather than at the armpit. Likewise, the thigh dimension would be measured further down the leg, rather than at the crotch. The seat measurement is being clarified because a literal interpretation of current instructions could lead to an incorrect measurement. These changes are intended to result in more comfortable garments, and make construction of garments to the dimensions of the exemption easier for manufacturers.

These revisions are not expected to have any adverse effect on manufacturers, consumers, or other parties. It is noteworthy that these changes do not change those specified dimensions, but rather where those dimensions are measured.

Effect of the proposed rule on small entities

Due to the nature of the revisions, they are unlikely to have any adverse impact on small businesses or other entities. Garments which comply with the dimensions stated in the 1997 exemptions as measured at the armpit and seat/crotch would also comply after the proposed revisions. Some manufacturers, including small producers, may make minor changes at a negligible

cost; these changes would be to make their products more marketable rather than as a result of the measurement revisions. The proposal would have no significant adverse effects on costs or prices of children's sleepwear, or on the competitive position of small manufacturers.

The proposal is not expected to have a significant impact on a substantial number of small businesses or other entities.

Environmental Impact

The proposed revisions would not require or encourage significant product modifications, and would not cause manufacturers to dispose of existing packaging or materials of construction. Existing inventories of finished products, including those at retail, would not be rendered unusable because of the revisions. Further, no inventories would require retrofit in order to comply with the revisions.

The revisions are not expected to have a significant effect on the materials used in the production or packaging of children's sleepwear, or in the amount of products discarded after the revisions. Therefore, no significant environmental effects will result from the proposed revisions to the location of measurement of exempted sleepwear garments.

Tab E

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

MEMORANDUM

DATE: November 30, 1998

TO : File

Through: William King, Jr., Acting AED for Engineering Sciences
Nicholas Marchica, Director, ESME

FROM : Margaret L. Neily, Project Manager
ESME

SUBJECT: Analysis of Public Comments on Proposed Technical Amendments to the Children's Sleepwear Flammability Standards

INTRODUCTION

On May 21, 1998, the U.S. Consumer Product Safety Commission published several technical amendments to the snug-fitting exemption of the Children's Sleepwear Flammability Standards, sizes 0 to 6x and 7 to 14. Commenters raised a number of issues, most of which were discussed thoroughly in the April 1998 briefing package for the proposed amendments. An evaluation of comments related to the proposed amendments, including some beyond the scope of the proposal, and other engineering issues is provided below.

The market for snug-fitting children's sleepwear continues to evolve, and staff comments here are made in light of changes observed since our April 1998 report. The staff have been monitoring the local marketing of snug-fitting sleepwear since the stay of enforcement ended in June 1998. New manufacturers have begun offering snug-fitting cotton sleepwear; even some AAMA members because of the competition. New fabrics with more stretch (85-100'%) have appeared. New fabric constructions including fine rib knits that appear to be interlocks at first glance, soft brushed patterned rib knits, and a variety of thermal constructions are now offered in snug-fitting sleepwear. Polyester/cotton blend thermal knits are available, perhaps in response to stability (shrinkage control) needs. Manufacturers have begun experimenting with combinations of FR and non-FR fabrics in the same garment, e.g. loose fitting top of FR polyester combined with snug-fitting pant of untreated cotton.

RESPONSES TO COMMENTS

1. The proposed amendments are an improvement.

Comment: American Marketing Enterprises, Inc., an importer of childrenswear commented that they agree with the recommendations of the staff to a certain extent. Similarly, the National Cotton Council (NCC), representing cotton producers, believes the proposed technical changes are an improvement.

Response: Garments on children observed by the staff while developing the proposed technical amendments demonstrated that comfortable, practical, snug-fitting sleepwear could be produced with these slight changes in the standards.

2. The 1996 amendments should be rescinded.

Comment: The Safe Children's Sleepwear Coalition (SCSC), a group formed in response to the Commission's decision in 1996 to exempt certain tight-fitting garments and garments intended for infants from the sleepwear flammability standards, commented that they oppose the 1996 amendments. SCSC stated its members "do not believe any technical changes to the amendments can make the new requirements for children's sleepwear effective" and thus "it would be counter-productive and misleading" to comment on specific measurement protocols. Rather, SCSC would like the Commission to rescind the 1996 amendments. The Commission also received nine other letters (apparently form letters) from hospitals, public interest groups, and fire/emergency groups asking that the Commission reconsider the 1996 exemption for tight fitting and infant garments.

Response: The purpose of the May 21, 1998, proposed rule was to propose necessary technical changes that would clarify the points where garment measurements should be made. The proposed rule has a very narrow scope. The comments of the SCSC and others mentioned above are really responding to the broader 1996 rulemaking and are beyond the scope of the technical amendments proposed in the May 21, 1998, notice.

3. The promised consumer education campaign is inadequate.

Comment: Six letters received with comments related to the proposed technical amendments were critical of the consumer education campaign promised by the American Apparel Manufacturers Association at the time the exemption for tight-fitting sleepwear was published. These form letters (from hospitals, public interest and fire/emergency groups) said that the "apparel industry has failed to agree on labeling or tight-fitting requirements or design and implement the promised educational

campaign. ....it is virtually impossible for consumers to judge the relative safety of such sleepwear garments in the marketplace".

Response: These comments are beyond the scope of the proposed technical amendments, but the issue is an important one. AAMA has declined to initiate a comprehensive consumer information campaign as originally planned with a press conference. AAMA indicated that they are prepared to do so when the sleepwear amendments are final and they are satisfied that saleable, wearable, and comfortable snug-fitting garments can be produced.

In the meantime, AAMA is actively distributing the artwork for the hang tags and reproducing copies of the brochure developed to inform consumers about safety and the new snug-fitting sleepwear at the point of sale. Early in 1997, AAMA distributed the artwork and brochure information to 40 organizations (AAMA members, non-members, and other interested parties). Since March 1998, 13 companies have requested the artwork for the hang tags. Approximately 3,500 brochures have been distributed by a major retailer and two major AAMA member companies. (From a personal communication with Mary Howell, AAMA, November 17, 1998)

There is still no formal industry coordination of consumer information efforts at this time. At trade shows, meetings and other communications with industry members, the CPSC staff have encouraged the use of a consistent message on hang tags to facilitate consumer understanding. All known manufacturers of snug-fitting sleepwear are marketing their garments with the basic information from the AAMA hang tag. Some flame resistant garments also carry a version of this information. The label states "Fabric and fit are important safety considerations for children's sleepwear. Sleepwear should be flame resistant or snug-fitting to meet U.S. Consumer Product Safety Commission sleepwear requirements". Labels further state that the garment attached is either flame resistant or should be worn snug-fitting. Some retailers have expanded their use of this labeling to store displays and have informed their salespeople and customers through training courses and in-house publications.

4. The upper arm dimension is too tight.

Comment: Two commenters requested an increase in the upper arm dimensions of the snug-fitting requirements. Gap, Inc., a garment producer and retailer, recommended an increase of 1/4 inch in upper arm dimensions of baby garments from size 9 months to 36 months (or size 3T) to improve comfort and fit. The American Apparel Manufacturers Association (AAMA), a large trade association of the apparel industry, recommends all upper arm measurements be increased 2 inches. AAMA disagrees with

Commission staff conclusions that saleable, wearable, and comfortable garments can be produced with current upper arm dimensions.

Response: The staff is not persuaded that an increase in upper arm dimensions is needed to produce comfortable, functional garments. Previous presentations from AAMA in 1997 requesting an additional 2 inches in the upper arm dimension were based on garments made with popular interlock fabrics that only had 55% stretch. No further technical support was provided with this most recent recommendation, and no substantiation was provided for the claim that such an addition to the upper arm dimension would not affect safety.

As indicated in earlier analyses by the staff, fabrics with inadequate stretch are not appropriate for use in this style of garment where the fabric must be worn in the stretched condition. The best fabrics available for the 1997 staff observations worked well in this snug-fitting style with 65%-85% stretch. Some of the newer fabrics being introduced to the snug-fitting sleepwear market since July 1998 stretch over 100% of their original dimension. This is more than enough to ensure comfort and accommodate a child's arm motion. Even the additional 1/4 inch increase in the upper arm dimension proposed by Gap appears unnecessary under these circumstances.

5. **Measurement method for upper arm should be simplified.**

Comment: Several commenters suggest that the current method for measuring the upper arm (three steps) is complicated and should be reduced to two. J.C. Penney, a major retailer, comments that the "upper arm measurement is too complicated for factory inspection and will lead to controversy between manufacturers, retailers and CPSC enforcement staff". They, along with AAMA, suggest measuring down the under arm seam 2 inches for infants and toddler sizes (12 mos. to 4T) and 3 inches down for sizes 4 to 14 before measuring the upper arm. Gap also suggests a measurement along the underarm seam as easier to follow and less prone to error.

Response: The staff recognizes that the measurement method for the upper arm is more complicated than for other typical garment dimensions measured by the industry. This is because the upper arm of the body is defined as a point between the shoulder and the elbow. Sleeves do not have elbows; and since some sleeve designs do not have a defined shoulder, the shoulder was defined by a logical extension of the side seam. The location of the upper arm can then be measured down the sleeve according to average body dimensions for each size. The CPSC staff observations described in the April 1998 briefing package showed this method produces a fairly accurate match with the upper arm of the children wearing the garments.

AAMA and the Gap suggested an easier way to measure the upper arm--a specified distance along the underarm sleeve seam. CPSC staff evaluated a large sample of snug-fitting garment styles to determine the impact of the simplified measurement method. Because the style of the sleeves varied, so did the location for the upper arm to be measured by the suggested method. In some cases, the upper arm would be measured further down the sleeve than where the child's upper arm is, allowing the sleeve to be larger or fuller for much of the sleeve than currently specified. In other cases, the measurement would be closer to the armhole than measurement by the current proposed amendment. This would create even more restrictions in the upper sleeve design, already the area offering the greatest design challenge to manufacturers.

The staff does not recommend this change. Even with the dimensional restrictions of the snug-fitting requirements, garment styles vary considerably. The staff suggests that manufacturers could, for various sizes of a particular style, determine the distance(s) down the underarm seam(s) that coincide with the point(s) where the measurement should be made by the standard method. This could provide the simplicity of the industry measurement proposals and the accuracy and maximum allowance for the upper arm dimension provided by the standard method. Because of style variations among garments and manufacturers, CPSC would continue to use the standard method for measuring the upper arm.

6. Diaper/training pant ease is needed in the seat measurement.

Comment: One commenter, J.C. Penney Company, notes that the standard garment dimensions do not allow for diaper or training pant ease (an increase in the width of the garment in the seat area). An allowable increase in the rise (the length of the garment in the seat area) produces ill-fitting garments.

Response: This comment is beyond the scope of the proposed amendments of May 21, 1998. The issue was discussed thoroughly in earlier briefing packages on the original amendments. For garments made of woven fabrics or knits with little or no stretch, extra fabric or ease in the seat is absolutely necessary for a practical, wearable garment. However, with the use of fabrics that stretch adequately for this style of garment (85 to 100% stretch), diaper ease is absolutely unnecessary. This photo from the 1998 staff observations illustrates the point with a garment that meets the standard dimensions measured as proposed in the May 1998 NPR. The rib knit fabric used in this size 2T garment has 80-85% stretch.

Room for Diapers
Garment 2, Size 2T

7. Measure thigh 1½ in down inseam instead of 1 inch.

Comment: AAMA recommended that the thigh measurement be taken 1½ inches below the crotch seam for all sizes instead of 1 inch. Although no specific justification was given for this recommendation in this comment, AAMA designers provided rationale in an August 14, 1997, phone conference. They indicated that because of the changing dimension of the pant in this area, the lower measuring point would help with getting the correct stride in the pant.

Response: The staff is not persuaded to change this measurement point further. In developing the proposed technical amendments, the staff received input from a wide variety of industry contacts, including childrenswear and actionwear design instructors. They indicated that it is typical industry practice to measure the thigh 1 inch down on the inseam. In August 1997, when AAMA members originally made this recommendation, they were still trying to design snug-fitting garments with interlock knits with inadequate stretch for this garment design. CPSC staff observations in 1998 showed that snug-fitting sleepwear on children could be made well following the industry practice of measuring 1 inch down the inseam. Again, the fabrics used in these successful observation garments had considerable stretch (65-85%).

8. Hourglass silhouette is needed for a top to fit properly.

Comment: Two commenters requested that the bottom sweep of a two piece garment be increased to the standard seat dimension rather than the waist dimension. Examples given by the J.C. Penney Company showed that the sweep of various sizes of boys and girls garments would have to stretch 14 to 28% of their original dimension to fit the hip. They noted other problems from their perspective: (1) a questionable pajama silhouette, (2) difficulty pulling the top over the head and shoulders, (3) the sweep would ride up to the waist with body movement, and (4) the fabric would be stretched loose (wrinkled) around the chest and waist.

Gap expressed similar concerns about the exaggerated undersizing of the sweep to the waist dimension, especially when factories are already manufacturing garments toward a negative "tolerance". They observed bunching as the garment rides up towards the waist and are concerned that this is a safety hazard. They propose that the sweep be less than or equal to the standard seat dimension for girls sizes 7 to 14 and toddler sizes 2XL and 3XL (similar to 2T and 3T in the standards) for reasons of comfort and fit.

Response: The snug-fitting garment silhouette is very different than the silhouette consumers have come to expect for pajamas. One reason the Commissioners wanted the industry to move forward with the consumer education campaign was to help consumers make the necessary adjustment in their expectations. These snug-fitting garments should be viewed realistically and appreciated for the safety of their design.

CPSC staff observed a variety of snug-fitting garments made of different fabrics and by different manufacturers during the development of the proposed technical amendments. None of the child models or parents, in the case of the infant, had difficulty putting on or removing the garments made to the proposed technical amendments.

The sweep is one of several dimensions for which commenters requested increased dimensions to improve fit and comfort. The sweep sized to the standard waist dimension has no problem stretching to fit the larger hip, if made of fabrics that stretch adequately. Even if the sweep is undersized one inch in production (the Gap's concern), the J.C. Penney examples discussed above must still only stretch approximately 14-28% of their original dimension. This is a small portion of the available stretch of the fabric.

During the proposal development, several manufacturers thought the hourglass silhouette option might be helpful for larger girls sizes where the seat is considerably larger than the waist, but not helpful for other sizes. The staff included the hourglass option in the observations because it had the potential

to reduce fabric bunching at the waist and/or produce a more functional garment.

For the CPSC staff observations, a girls size 12 garment was constructed with a conservative hourglass silhouette; the sweep was equal to the smaller chest dimension required by the standard rather than the larger seat dimension. The top of the garment fit nicely while the model stood still; however, when she raised her arms or moved during the observation, the sweep flared away from the body significantly, exposing the bottom edge of the garment.

All of the garments observed on children by the staff showed some wrinkling or bunching of fabric at various points, most commonly around the waist, knees and elbows. None of the pajama tops pulled up to the waist as anticipated. The concept of snug-fitting was readily defeated with the flaring of the sweep of the hourglass silhouette in the 2-piece garment. For this reason, the staff did not recommend this option in the May 21, 1998, proposal and does not recommend it now.

9. Manufacturing, sewing tolerances are still needed.

Comment: The National Cotton Council commented that sewing and shrinkage tolerances are still needed to realistically meet the dimensional requirements.

Response: LS is providing the major response to these comments. Difficulties in controlling shrinkage were previously cited as reasons for allowing positive manufacturing tolerances. This fall manufacturers of successful products are using several methods to control the shrinkage of their snug-fitting garments: fabric compacting, garment washing, and fabrics made of more stable cotton/polyester blends.

10. General comments on fit problems.

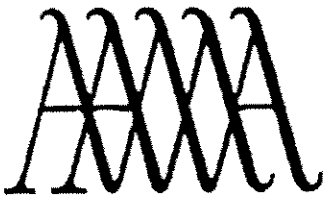
Comment: The National Cotton Council, believes the proposed amendments "do not go far enough in correcting the garment fit problems and could be further improved without affecting the safety provided by the standard". The Safe Children's Sleepwear Coalition (SCSC), a group objects to the tight-fitting exemption, is concerned that any changes may not help the situation because they believe parents will purchase larger sizes and defeat the tight-fit intended by the rule.

Response: Neither commenter provided data or other evidence to support their position. CPSC staff observations from fittings with real garments and children were reported in April 1998. These showed that comfortable, functional garments that fit the size children intended can and are being produced with the measurement clarifications proposed.

11. The chest should be measured 1 inch below the armpit.

Comment: Gap proposes that the chest measurement be taken 1 inch below the armpit to armpit line. "Because the armpit is a sewing point, the garment is prone to stretching in this area, compromising the accuracy of the measurement. The one inch modification will eliminate this inaccuracy".

Response: This comment is beyond the scope of the proposed amendments. Although other industry members have previously mentioned that this measurement could be shifted to 1 inch below the armpit, none indicated that it was troublesome to have the chest measured at the armpit. For that reason, it was not included in the staff observations of snug-fitting garments for developing the proposed technical amendments. During the CPSC fittings reported in April 1998, the staff observed no problems with fit or function with garments made with chest measurements determined at the armpit.



AMERICAN APPAREL MANUFACTURERS ASSOCIATION

NEWS RELEASE

For Immediate Release
December 14, 1998

Contact: Jack Morgan
(703) 524-1864

Happy Holidays to All and to All a Good Night...

U.S. Apparel Manufacturers Offer Children's Sleepwear Safety Tips

Arlington, VA – With the holiday season now upon us, the American Apparel Manufacturers Association (AAMA) would like to remind consumers of some important safety tips regarding children's sleepwear.

"Our message to families with children this holiday season and throughout the year is a very simple one," said AAMA President Larry Martin. "Please, put your children to bed in sleepwear that is snug-fitting or made from flame-resistant fabric. If you stick with sleepwear that meets the standards of the U.S. Consumer Product Safety Commission, the likelihood of a serious injury resulting from a fire-related accident is remote."

The Consumer Product Safety Commission (CPSC) is the federal agency that sets national standards for flammability in children's sleepwear.

Making the right sleepwear choices for your child can help prevent fire-related accidents. Today, with a vast array of children's apparel available to consumers, it's important that families follow the guidelines below for safe sleepwear:

- Look for the SLEEPWEAR label or hang tag when you shop – the garments carrying the SLEEPWEAR label were made by manufacturers who want to help you make the safest choices for your children.

- Buy flame-resistant sleepwear. Flame-resistant sleepwear does not ignite easily and must self-extinguish quickly to meet CPSC flammability requirements for children's sleepwear.

- If you choose natural fibers, make sure you buy garments which will fit snugly. Snug-fitting garments which meet CPSC sizing guidelines and are made from fabrics which are not flame-resistant will not create an unreasonable risk of burn injuries to children.

- Keep matches, lighters and candles out of the reach of children.

- Make sure your children know what to do in case of fire.

- **Do not allow your children to sleep in loose-fitting or oversized garments such as T-shirts, sweatsults, or other apparel made from non-flame-resistant fabrics.** These items ignite more easily if exposed to an open flame or comparable heat source and may cause severe burn injuries.

The American Apparel Manufacturers Association is offering this safety information as a public service. We hope these tips are especially useful during the holiday season when children are frequently participating in activities where they could be at risk for burn injuries if they're wearing sleepwear that fails to meet CPSC safety standards.

The AAMA is the central trade organization representing U.S. apparel manufacturers that produce over 80 percent of the clothing sold at wholesale in the United States. AAMA member companies manufacture all types of apparel and are located in virtually every state.

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Tab F

NEWS from CPSC

U.S. Consumer Product Safety Commission

Office of Information and Public Affairs Washington, DC 20207

FOR IMMEDIATE RELEASE
November 19, 1998
Release # 99-025

CONTACT: Ken Giles
(301) 504-0580 Ext.1184

CPSC Warns About Flammable Loose-Fitting Garments Used As Children's Sleepwear

WASHINGTON, D.C. - The U.S. Consumer Product Safety Commission (CPSC) warns people not to put children to sleep in loose-fitting T-shirts or other over-size clothes made from cotton or cotton blends. These garments can catch fire easily and are associated with 200 to 300 emergency room-treated burn injuries to children annually. Loose-fitting clothing stands away from the body, making contact with an ignition source more likely. Loose-fitting, non-flame-resistant clothing allows an air space next to the body that helps keep the fire burning, possibly injuring children.

CPSC Vice-Chairman Thomas Moore said, "It is safer to put your children in flame-resistant or snug-fitting sleepwear, not over-size, loose-fitting cotton or cotton-blend garments."

CPSC sets national safety standards for children's sleepwear flammability. These standards protect children from serious burn injuries if they come in contact with an open flame, such as a match, lighter, or stove burner. The standards have prevented thousands of serious burn injuries since the early 1970s. Under federal safety rules, garments sold as children's sleepwear for sizes larger than nine months and up to size 14 must be either flame-resistant or snug-fitting.

Flame-resistant garments do not continue burning when removed from a small open flame. Snug-fitting garments need not be flame-resistant because they are made to fit closely against a child's body. Their stretchy fabrics make them comfortable. Snug-fitting sleepwear does not ignite easily and, even if ignited, does not burn as rapidly because there is little air under the garment to feed a fire.

Most manufacturers are using hangtags on their snug-fitting sleepwear to tell consumers that the product meets federal safety standards. The hangtags remind consumers that a snug fit or flame resistance is necessary for safety.

The U.S. Consumer Product Safety Commission protects the public from the unreasonable risk of injury or death from 15,000 types of consumer products under the agency's jurisdiction. To report a dangerous product or a product-related injury and for information on CPSC's fax-on-demand service, call CPSC's hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270. To order a press release through fax-on-demand, call (301) 504-0051 from the handset of your fax machine and enter the release number. Consumers can obtain this release and recall information at CPSC's web site at http://www.cpsc.gov. Consumers can report product hazards to info@cpsc.gov.

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Tab G

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

MEMORANDUM

Date: December 3, 1998

TO: Margaret L. Neily, ES, Project Manager, Children's Sleepwear

FROM: Carolyn Meiers, ESHF, Engineering Psychologist, x1281 CM

Through: Jacqueline Elder, Deputy Assistant Executive Director
Office of Hazard Identification and Reduction

Dr. Robert B. Ochsman, Director, Human Factors Division
Directorate for Engineering Sciences

SUBJECT: Response to Comments on Notice of Proposed Rulemaking Regarding Changes to the Amendments for Children's Sleepwear

On May 21, 1998, the U.S. Consumer Product Safety Commission (CPSC) published a Notice of Proposed Rulemaking that recommended technical changes to the children's sleepwear standards (16 CFR Parts 1615 and 1616). JCPenny's technical design staff raised the following issue regarding this proposal.

ISSUE: "General Industry Standards Should Be Used for Measurements. The measurements proposed by the CPSC for sizes 7-14 are based on one university study, rather than generally accepted industry standards. Standards CS 53-48 (Girls) and CS 51-50 (Boys) should be the applicable measurement standards for children's sizes 7-14."

RESPONSE: Human Factors staff would like to note that the standards referred to by JCPenney, CS 53-48 (Girls) and CS 51-50 (Boys), are incorrectly titled. The correct titles for the standards are CS-153-48 (Girls) and CS 155-50 (Boys)[1]. However, these are not the current versions of the National Bureau of Standards (NBS) sizing standards. The most recent versions are NBS Voluntary Product Standards PS 54-72 (Girls) and PS 36-70 (Boys).

The snug-fitting dimensions for sizes 7-14 in the children's sleepwear standards are based on these current standards and the data from the University of Michigan study, "Anthropometry of Infants, Children, and Youths to Age 18 for Product

[1] The CPSC staff clarified the citations for the standards with Ms. Jeanne O'Neil, an attorney with JCPenney.

Safety Design. The majority of the CPSC snug-fitting dimensions match those of the NBS standards.

The sleepwear industry indicated to CPSC staff at an April 25, 1995 meeting that they do not adhere to any consistent sizing standards.[2] Therefore, CPSC staff developed the snug-fitting dimensions from the most current and reliable data available that pertain to typical body dimensions of children.

[2] April 25, 1995 Meeting Log recorded by Terrance Karels, Project Manager for Children's Sleepwear.

Tab H

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

MEMORANDUM

DATE: November 25, 1998

TO : Margaret L. Neily, Directorate for Engineering Sciences, Project Manager, Children's Sleepwear

Through: Andrew G. Ulsamer, Associate Executive Director, Directorate for Laboratory Sciences AGU

Robert T. Garrett, Director, Division of Engineering RTG

FROM : Linda Fansler, Division of Engineering LF

SUBJECT: Response To Comments On Technical Amendments To the Children's Sleepwear Standards

This memo provides the Laboratory Sciences' response to comments received as a result of publishing the Federal Register Notice of Technical Amendments to the Children's Sleepwear Standards.

ISSUE: Manufacturing, Sewing Tolerances Still Needed

COMMENT: Tolerances are currently used during sewing and manufacturing of knit garments. "It is impossible to not have 'plus or minus' tolerances in a size specification." "... CPSC's policy ... only minus tolerances are allowed." Manufacturers are forced to undercut these already snug fitting garments which results "in sub standard garments". Not allowing for both a positive and negative tolerance is "asking the trade to operate outside of the normal manufacturing procedures". *American Marketing Enterprises, Inc., Dennis Sargent.*

COMMENT: "To comply with the published measurements, our manufacturers have to undercut garments. This yields a garment that is too tight and will force the consumer to buy a larger size creating new safety hazards from garments that are too long." *American Apparel Manufacturers Association, Larry Martin, President, Mary Howel, Director of Product Divisions.*

COMMENT: The National Cotton Council "strongly believes that there is a need for a sewing tolerance". *National Cotton Council of America, Phillip J. Wakelyn, Senior Scientist, Environmental Health and Safety.*

RESPONSE LS staff recognizes that "plus or minus" tolerances are normally used in the production of all garments and allow for permissible variations to the pattern specifications that can occur during cutting or sewing of the garment.[1] However, the addition of a production tolerance which would increase the garment dimensions from those specified in the amended children's sleepwear standards, would result in a less than snug-fitting sleepwear garment. The snug or close to the body fit is important to maintain as the fit can influence the garment's flammability. The likelihood of ignition increases when the wearer's clothing stands away from the body. The excess fabric can function as a connector to an ignition source and increases the oxygen available on the underside of the garment.[2] It also means that the body no longer serves as a heat sink.

The garment dimensions specified in the standard are maximum dimensions for the seven body locations indicated. Manufacturers are allowed to sell snug-fitting. sleepwear garments as long as the garment dimensions for a specific size are not exceeded. Knit fabrics are available with a sufficient degree of stretch that even if the manufacturer undercuts the fabric somewhat, the garment would still fit the intended size child.

Snug-fitting garments acceptable to consumers were available for purchase during the stay of enforcement.[3] Manufacturers have learned how to meet the sizing requirements for the "skin-tight or nearly skin-tight" garments sold under the stay and labeled as underwear[4] and for traditional long underwear also tight fitting. In addition, CPSC staff are aware of children's sleepwear garments manufactured to the dimensions specified in the sleepwear standards, that are currently being sold to consumers.[5] Manufacturers are able to produce acceptable sleepwear garments through the selective use of specific knit fabrics that allow for the necessary stretching and recovery and result in a garment that hugs the body, and through careful planning before and during the manufacturing process to build in acceptable tolerances to the pattern so that the finished garment after assembly will meet the required specifications.

ISSUE: Shrinkage Tolerance Needed

COMMENT: The National Cotton Council "strongly believes that there is a need for a ... 5% shrinkage tolerance". *National Cotton Council of America, Phillip J. Wakelyn, Senior Scientist, Environmental Health and Safety.*

[1] Superscript refers to references on page 3.

RESPONSE: The amount of shrinkage that occurs in a garment varies and is dependent on the fiber type (or types in the case of blends), quality of fiber, fabric construction and weight, method of manufacture, type of finishing process, and subsequent laundering conditions. The amendments to the children's sleepwear standards do not specify a particular fiber or blend of fibers, and manufacturers may choose among a variety of fiber contents, fabric constructions, etc. when manufacturing snug-fitting garments. A 5% tolerance for shrinkage is not needed for all fabrics and could allow for garments to be less than snug-fitting if they exceed the maximum dimensions after laundering. In addition, it would be impractical to determine compliance at the retail or manufacturing levels as garments would have to be laundered first to determine the amount of shrinkage before garment dimensions could be compared to those specified in the sleepwear standards.

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2. Memorandum To Terrance R. Karels, Project Manager, Children's Sleepwear Project, ECPA, From Linda Fansler, ESME, Technical Rational Supporting "Tight Fitting" Children's Sleepwear Garments, March 14, 1994, U.S. Consumer Product Safety Commission.

3. Log Of Meeting, Children's Sleepwear - Snug Fitting Requirements, February 18, 1998, Margaret Neily, ESME, CPSC And Other Commission Staff With Manufacturers And Retailers Marketing Snug-Fitting Sleepwear, U.S. Consumer Product Safety Commission.

4. Briefing Package Children's Sleepwear Flammability Standards, Technical and Enforcement Policy Amendments, April 27, 1998, U.S. Consumer Product Safety Commission.

5. Children's Sleepwear Garments Purchased At Local Retailers During The Months Of August and November, 1998, By U.S. Consumer Product Safety Commission Compliance and Laboratory Sciences Staff.