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Memorandum

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TO: The File

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SUBJECT: 1999 - 2006 Reported Submersions and Other Hazards Associated with Liquids/Chemicals in Buckets/Pails, 2008 Memorandum¹

This memorandum contains information on submersions and other hazards reported to CPSC staff associated with buckets and pails containing liquids and/or chemicals. There was not sufficient data to generate national estimates so what follows in this report are frequency counts of reports to CPSC staff for the time period 1999 - 2006 for children under five years of age. There were 188 reports including 95 fatalities related to buckets or pails containing liquids or chemicals. Of the 188 reports, 121 were related to submersions. Since submersions accounted for the majority of the reports, this memorandum has been separated into two sections: one for submersions and the other for the remaining hazards related to buckets and pails containing liquids or chemicals. Following the submersion hazards section that characterizes 94 fatalities and 27 non-fatal submersion incidents is the other hazards section which has 1 reported fatality and 66 other non-fatal reports characterized by hazards such as thermal burns, chemical exposure/burns, poisoning, and inhalation. Other characteristics are counted as well such as gender, age, capacity, and type of liquid or chemical in the bucket or pail.

¹ This analysis was prepared by the CPSC staff, has not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

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Bucket/Pail Submersions

There were 121 reports to CPSC staff concerning submersions in buckets or pails for children younger than five years of age for the time period 1999 - 2006.

Table 1 gives the frequency of reported fatalities and injuries based on bucket/pail type. There were 94 fatalities associated with submersions. Sixty-two of the 121 fatality and injury submersion reports identified the bucket or pail as five gallon².

Table 1
Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
for Children Under 5 Years of Age by Bucket/Pail Type, 1999 - 2006³

Bucket/Pail Type	Fatality	Injury	Total Fatality & Injury
All Buckets/Pails	94	27	121
5 Gallon	55	7	62
Other Size	1	2	3
Unknown	38	18	56

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

A voluntary standard requirement for a label on five gallon buckets warning of the submersion hazard was approved in 1993⁴. The standard was reapproved in 2004⁵. Table 2 gives the number of reported fatalities and injuries based on bucket/pail type and submersion warning labeling. For submersion warning labeling, 19 of the 20 buckets/pails that had confirmed labels were identified as five gallon. Of the 62 incidents associated with five gallon buckets/pails, 19 (30%) were labeled, 11 (18%) were not, and the label status for 32 (52%) was unknown.

Table 2
Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
for Children Under 5 Years of Age by Bucket/Pail Type and Submersion Warning Labeling,
1999 - 2006

Bucket/Pail Type	Submersion Warning Label	No Submersion Warning Label	Unknown
All Buckets/Pails	20	15	86
5 Gallon	19	11	32
Other Size	0	2	1
Unknown	1	2	53

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

² Five gallon buckets or pails are defined as buckets or pails that have a four to six gallon capacity.

³ There were no unknowns or no injury reports for submersions.

⁴ "Emergency Standard Specification for Cautionary Labeling for Plastic Five-Gallon Open-Head Containers (Buckets)", ASTM, ES 26 – 93.

⁵ "Standard Specification for Cautionary Labeling for Five-Gallon Open-Head Plastic Containers", ASTM, F 1615 – 95 (Reapproved 2004).

Table 3 provides a breakdown by year and bucket/pail type for submersion fatalities and injuries. For each year, the number of fatalities reported is considerably higher than injuries reported.

Table 3
Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
for Children Under 5 Years of Age by Report Year & Bucket/Pail Type, 1999 - 2006

Report Year	Bucket/Pail Type	Fatality	Injury	Total Fatality & Injury
1999	All Buckets/Pails	19	4	23
	5 Gallon	14	3	17
	Other Size	1	1	2
	Unknown	4	0	4
2000	All Buckets/Pails	12	3	15
	5 Gallon	7	1	8
	Other Size	0	0	0
	Unknown	5	2	7
2001	All Buckets/Pails	21	7	28
	5 Gallon	13	2	15
	Other Size	0	1	1
	Unknown	8	4	12
2002	All Buckets/Pails	7	4	11
	5 Gallon	4	0	4
	Other Size	0	0	0
	Unknown	3	4	7
2003	All Buckets/Pails	10	1	11
	5 Gallon	7	0	7
	Other Size	0	0	0
	Unknown	3	1	4
2004*	All Buckets/Pails	12	5	17
	5 Gallon	7	0	7
	Other Size	0	0	0
	Unknown	5	5	10
2005*	All Buckets/Pails	6	3	9
	5 Gallon	2	1	3
	Other Size	0	0	0
	Unknown	4	2	6
2006*	All Buckets/Pails	7	0	7
	5 Gallon	1	0	1
	Other Size	0	0	0
	Unknown	6	0	6

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). * Italics denote period for which reporting is incomplete.

Table 4 records the number of reported submersion fatalities and injuries by gender which is almost evenly split between male and female. There was one injury where the gender was unknown.

Table 4
 Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
 for Children Under 5 Years of Age by Gender, 1999 - 2006

Gender	Fatality	Injury	Total Fatality & Injury
Male	45	17	62
Female	49	9	58
Unknown	0	1	1

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 5 gives the yearly age category breakouts for the reported submersions. The one year old category accounts for the majority of the submersion reports. This is followed by the less than one year old category. Together these two age categories account for 118 of the 121 reported submersions. There was one reported fatality of a four year old as well but few details were given about this fatality.

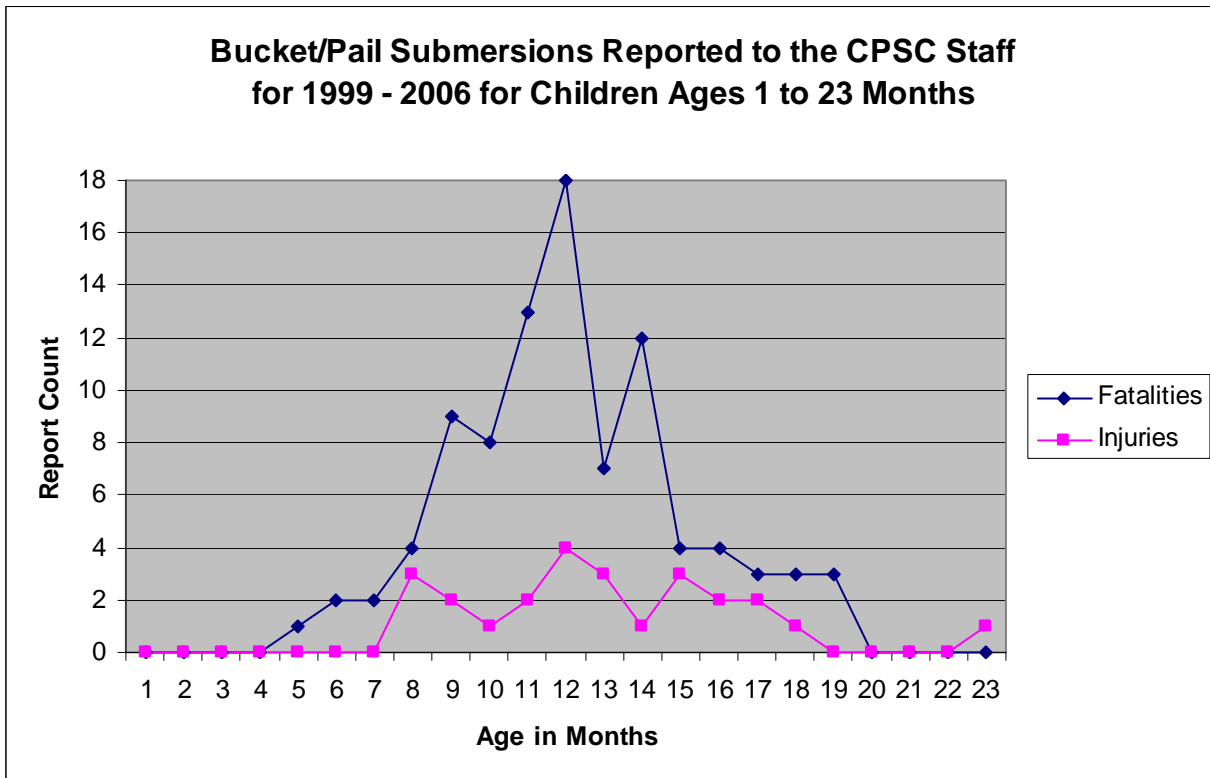
Table 5
 Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
 for Children Under 5 Years of Age by Age Category, 1999 - 2006

Age Category	Fatality	Injury	Total Fatality & Injury
Less than 1 Year	39	8	47
1 Year	54	17	71
2 Year	0	2	2
3 Year	0	0	0
4 Year	1	0	1

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Figure 1 gives a breakdown of the age category reports by age in months for one month to twenty-three months. Notice that the nine to fourteen months age categories are where many of the reports are concentrated.

Figure 1⁶
 Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions Age Breakout



Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 6 summarizes submersion incidents based on the reported contents of the bucket. The majority of the reports identified the liquid as water or water and some other chemical solution.

Table 6
 Fatalities & Injuries Reported to CPSC Staff for Bucket/Pail Submersions
 for Children Under 5 Years of Age by Liquid Type, 1999 - 2006

Liquid Type	Fatality	Injury	Total Fatality & Injury
Water	37	8	45
Water & Other Chemical Solution	39	11	50
Liquid Chemical	1	5	6
Unknown Liquids	17	3	20

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

⁶ CPSC databases code 1 to 23 months. After 23 months ages are coded in years. A child reported as a 1 year old is coded in the data as a 12 month old.

Other Hazards Associated with Liquids/Chemicals in Buckets/Pails

Of the 188 reported incidents, there were 67 non-submersion reports concerning other hazards associated with liquids/chemicals in buckets or pails for children younger than five years of age for the time period 1999 - 2006. These other hazards were thermal burns, chemical exposure/burns, poisoning, and inhalation.

Table 7 presents the number of reported non-submersion incidents based on bucket/pail type. Of the 67 reports, there was one fatality, one no injury report, and one incident where the disposition of the child was unknown. The remaining 64 reports were injuries. There were two reports of the 67 identifying the bucket or pail type as five gallon. In the remaining 65 reports, the bucket or pail type was not specified.

Table 7

Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in Buckets/Pails for Children Under 5 Years of Age by Bucket/Pail Type, 1999 - 2006

Bucket/Pail Type	Fatality	Injury	No Injury	Unknown	Total
All Buckets/Pails	1	64	1	1	67
5 Gallon	0	1	1	0	2
Other Size	0	0	0	0	0
Unknown	1	63	0	1	65

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 8 gives a breakdown by hazard type and bucket/pail type for non-submersion fatalities, injuries, no injury, and unknown. The one reported fatality was from thermal burns. The poisoning and thermal burns categories account for the majority of the other hazards. This is followed by the chemical exposure/burns hazard category.

Table 8
 Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in
 Buckets/Pails for Children Under 5 Years of Age by Hazard Type & Bucket/Pail Type,
 1999 - 2006

Hazard Type	Bucket/Pail Type	Fatality	Injury	No injury	Unknown	Totals
Thermal Burns	All Buckets/Pails	1	23	0	0	24
	5 Gallon	0	0	0	0	0
	Other Size	0	0	0	0	0
	Unknown	1	23	0	0	24
Chemical Exposure/Burns	All Buckets/Pails	0	13	1	1	15
	5 Gallon	0	1	1	0	2
	Other Size	0	0	0	0	0
	Unknown	0	12	0	1	13
Poisoning	All Buckets/Pails	0	26	0	0	26
	5 Gallon	0	0	0	0	0
	Other Size	0	0	0	0	0
	Unknown	0	26	0	0	26
Inhalation	All Buckets/Pails	0	2	0	0	2
	5 Gallon	0	0	0	0	0
	Other Size	0	0	0	0	0
	Unknown	0	2	0	0	2

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 9 summarizes reports by year and hazard type.

Table 9
 Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in
 Buckets/Pails for Children Under 5 Years of Age by Year & Hazard Type, 1999 - 2006⁷

Year	Hazard Type	Fatality	Injury	No injury	Unknown	Totals
1999	Thermal Burns	0	3	0	0	3
	Chemical Exposure/Burns	0	1	0	0	1
	Poisoning	0	1	0	0	1
	Inhalation	0	1	0	0	1
2000	Thermal Burns	0	3	0	0	3
	Chemical Exposure/Burns	0	3	0	0	3
	Poisoning	0	0	0	0	0
	Inhalation	0	0	0	0	0
2001	Thermal Burns	0	4	0	0	4
	Chemical Exposure/Burns	0	1	0	0	1
	Poisoning	0	4	0	0	4
	Inhalation	0	1	0	0	1
2002	Thermal Burns	1	3	0	0	4
	Chemical Exposure/Burns	0	4	1	1	6
	Poisoning	0	5	0	0	5
	Inhalation	0	0	0	0	0
2003	Thermal Burns	0	1	0	0	1
	Chemical Exposure/Burns	0	1	0	0	1
	Poisoning	0	3	0	0	3
	Inhalation	0	0	0	0	0
2004*	Thermal Burns	<i>0</i>	2	0	0	2
	Chemical Exposure/Burns	<i>0</i>	1	0	0	<i>1</i>
	Poisoning	<i>0</i>	8	0	0	8
	Inhalation	<i>0</i>	0	0	0	<i>0</i>
2005*	Thermal Burns	<i>0</i>	4	0	0	4
	Chemical Exposure/Burns	<i>0</i>	2	0	0	2
	Poisoning	<i>0</i>	4	0	0	4
	Inhalation	<i>0</i>	0	0	0	<i>0</i>
2006*	Thermal Burns	<i>0</i>	3	0	0	3
	Chemical Exposure/Burns	<i>0</i>	0	0	0	<i>0</i>
	Poisoning	<i>0</i>	1	0	0	<i>1</i>
	Inhalation	<i>0</i>	0	0	0	<i>0</i>

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations). * Italics denote period for which reporting is incomplete.

Table 10 gives the number of reported non-submersion incidents by gender which shows more males being injured from other hazards than females.

⁷ Most bucket types were unknown and so this table does not include yearly bucket type breakdowns.

Table 10
 Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in
 Buckets/Pails for Children Under 5 Years of Age by Gender, 1999 - 2006

Gender	Fatality	Injury	No injury	Unknown	Total
Male	1	43	0	0	44
Female	0	21	1	1	23

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 11 records age category breakouts for the reported other hazards. The one year old category accounts for the majority of the reports. This is followed by the two and three year old age categories and then the less than one year old age category. Also, there was one incident involving a four year old.

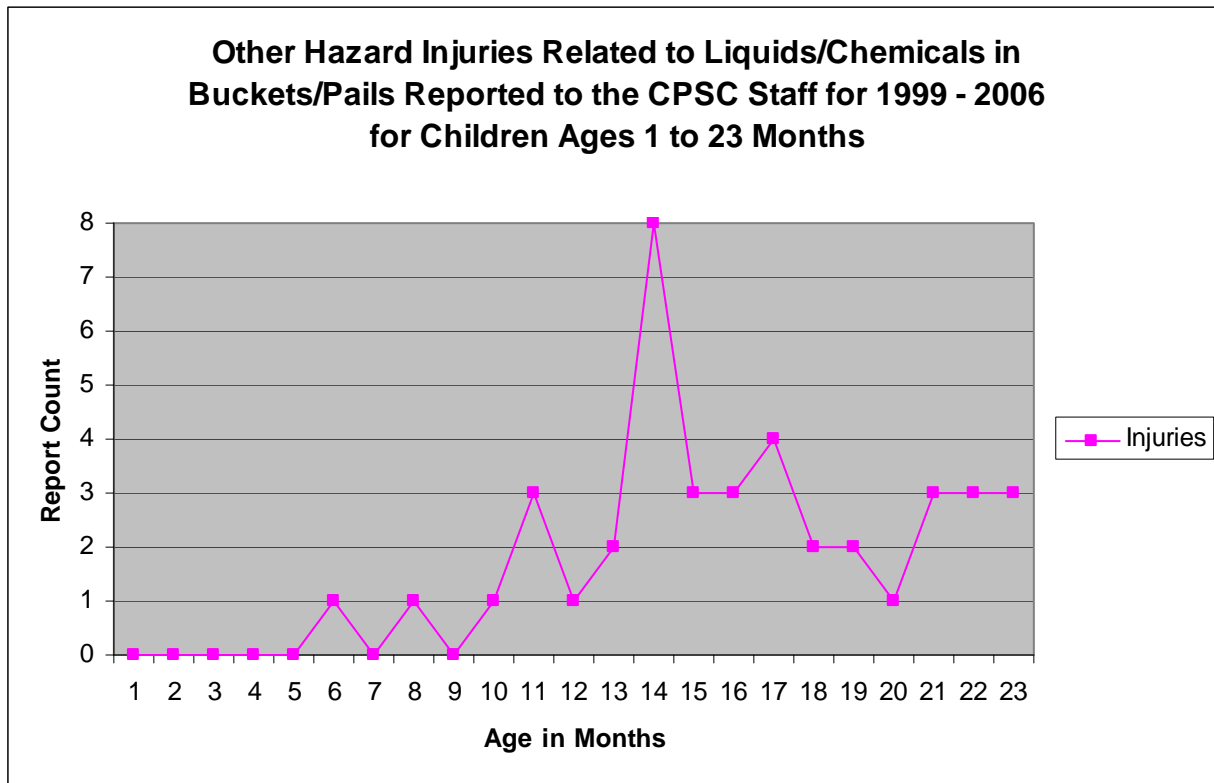
Table 11
 Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in
 Buckets/Pails for Children Under 5 Years of Age by Age Categories, 1999 - 2006

Age Category	Fatality	Injury	No injury	Unknown	Totals
Less than 1 Year	0	6	0	0	6
1 Year	0	35	1	1	37
2 Year	1	12	0	0	13
3 Year	0	10	0	0	10
4 Year	0	1	0	0	1

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Figure 2 gives a breakdown of the age category reports by age in months for one month to twenty-three months. The graph appears to be increasing to the fourteen months age category at which it peaks then declines for injuries.

Figure 2
 Reports to CPSC Staff Concerning Other Hazards Associated
 with Liquids/Chemicals in Buckets/Pails Age Breakout⁸



Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Table 12 characterizes reported incidents based on contents of the bucket or pail. The majority of the reports are divided among water, water and some other chemical solution, or other liquid. There were two cases of a non-liquid chemical in the bucket or pail in addition to the incidents involving liquids.

⁸ The 1 reported fatality was not included in this graph.

Table 12
 Reports to CPSC Staff Concerning Other Hazards Associated with Liquids/Chemicals in
 Buckets/Pails for Children Under 5 Years of Age by Liquid Type, 1999 - 2006

Liquid Type	Fatality	Injury	No injury	Unknown	Totals
Water	1	19	0	0	20
Water & Other Chemical Solution	0	19	1	1	21
Liquid Chemical	0	21	0	0	21
Non-liquid Chemical	0	2	0	0	2
Unknown Liquids	0	2	0	0	2
Unknown Liquid or Solid	0	1	0	0	1

Source: CPSC databases including NEISS (National Electronic Injury Surveillance System), IPII (Injury and Potential Injury Incidents), DTHS (Deaths) and INDP (In Depth Investigations).

Appendix

Methodology for Extracting Reported Submersions and Other Hazards Associated with Liquids/Chemicals in Buckets/Pails

Data were extracted on December 10, 2007 from NEISS, IPII, DTHS and INDP for the product code 1143 (Buckets or Pails) or the keywords in the narrative field " 5-GAL", " 5 GAL", " FIVE GAL", " FIVE-GAL", "BUCKET", or "PAIL" for the time period 1999 - 2006 for under 5 years of age (approximately 800 incidents). Reports were reviewed to eliminate cases that did not involve the bucket/pail containing some type of liquid or chemical as the hazard. It should be noted that, for a given year, incidents are included on an ongoing basis for IPII and DTHS. In particular, additional reports are generally received for the most recent years. Information from these cases was extracted into an Excel spreadsheet and sorted by incident state and date. Source documents were checked to eliminate duplicate incident reports. As fatal incidents are notable events in the community where they occur, there were often multiple news reports (IPII), a medical examiner's report (IPII), a death certificate (DTHS), an in-depth investigation (INDP) and, less frequently, a hospital emergency department report (NEISS) for a single incident. IPII is a mixture of various types of information including newspaper clippings, consumer complaints, and reports from other government agencies such as medical examiners/coroners. Information is voluntarily submitted to IPII, so that staff cannot be sure that information on all the deaths has been received. Once the incident set was established, the incidents were examined to code the additional characteristic of liquid type.