

UNITED STATES CONSUMER PRODUCT SAFETY COMMISSION

Petitioners:

The Safety Institute

Carol Pollack-Nelson, Ph.D., Independent Safety Consulting

Cash, Krugler & Fredericks, LLC

PETITION FOR RECALL TO REPAIR/RETROFIT AND RULEMAKING

Petitioners, The Safety Institute, Carol Pollack-Nelson, and Cash, Krugler & Fredericks, LLC (hereinafter "Petitioners"), pursuant to 16 C.F.R. § 1051 Procedure for Petitioning for Rulemaking, request that the U.S. Consumer Product Safety Commission initiate mandatory rulemaking to set safety standards for the design and installation of residential elevators to eliminate excessive space between the elevator car door/gate (interior door) and hoistway or swing door (exterior door).

In many home elevators, and similar versions found in older apartment and commercial buildings, the clearance between the two doors is large enough to allow children as old as 12 years to fit between them. When the elevator is called to another floor, the hoistway door automatically locks, and the child's body is carried along with the elevator car until it meets the obstruction of the sill, where the child's body – usually the head – is crushed. Industry has been aware of these dangers for more than 80 years, but has failed to adopt an appropriate, safe voluntary standard to address this design flaw. At least 55 child deaths have occurred since 1967; the most recent known death occurred in 2009. Since 2010, there have been three serious permanent debilitating injuries resulting from child entrapment.

A mandatory standard is required because the gap between the doors that is permitted by the voluntary standard has caused deaths and serious injuries. Efforts to work through the voluntary standards process, as described in this petition, have not adequately addressed the defect and therefore, have not reduced the risk of harm. In fact, 35 years ago, the voluntary standards committee actually changed the dimensions for residential elevators from a maximum gap of 4 inches between the two doors, to the less-safe 5-inch gap.

The petitioners also request that the U.S. Consumer Product Safety Commission order a recall (to repair) of all residential elevators that allow a gap between the hoistway and swing doors of more than 4 inches. Recalled defective doors should be retrofitted with a device that would either detect the presence of a child or small adult in the door path and prevent the elevator from operating or physically fill the gap to prevent children and small adults from becoming entrapped.

Industry Knowledge of Design Defect

The elevator industry has known about the entrapment hazard in swing door elevators for

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at least eight decades. In 1931, Otis Elevator Company obtained a patent for an inexpensive 6-inch space guard to prevent child entrapment. In 1932, Otis sent a letter to its customers warning them about this hazard.¹ In 1943, the company followed up; an Otis General Service Manager sent an inter-office memo reiterating the dangers of excessive space between the hoistway doors and the threshold. The elevator company was concerned that buildings may have changed hands since the original alert went out, leaving the current owners unaware of the threat, or that the original owner ignored the warning or installed a space shield, which fills the gap and makes it impossible for a child to fit in the space, but failed to remove projecting hardware.²

In 1955, the first Residence Elevator Code addressed the entrapment issue. ASME Elevator Safety Code limited distance between the doors to a maximum of 4 inches. (At the time, there were no accordion doors on elevators – this was a flat-to-flat measurement.)³ But, in 1981, for unknown reasons, the ASME changed the rule to widen the gap, allowing a maximum of 5 inches between the doors.

ASME standard A 17.1, Sec. 5.3.1.7.2 states:

Clearance Between Hoistway Doors or Gates and Landing Sills and Car Doors or Gates. The clearance between the hoistway doors or gates and the hoistway edge of the landing sill shall not exceed 75 mm (3 in). The distance between the hoistway face of the landing door or gate and the car door or gate shall not exceed 125mm (5 in).⁴

In 1950, Otis General Service Manager again noted “recent occurrence of accidents” caused by excessive space between the hoistway and elevator car doors, suggesting that many elevators remained unremedied.⁵ A 1963 memo noted the rise in liability claims against the company and suggested a survey of all Otis elevators under a service contract with sub-standard safety conditions– including the condition of too much space between the hoistway and elevator doors.⁶

In the early 1990s, the residential elevator industry introduced accordion doors for home elevators; this only increased the entrapment hazard. The accordion door’s flexibility and its peaks and valleys create excess space, above and beyond the 5-inch gap permitted by

¹ Subject: Automatic Elevator Space conditions Between the Hoistway Doors and the Threshold; H.R. Otto; Otis Elevator Company; September 30, 1943.

² Subject: Automatic Elevator Space conditions Between the Hoistway Doors and the Threshold; H.R. Otto; Otis Elevator Company; September 30, 1943

³ American Standard Safety Code for Elevators; Private Resident Elevators and Inclined Lifts; American Society of Mechanical Engineers; June 15, 1955

⁴ Standard A 17.1, Sec. 5.3.1.7.2; ASME

⁵ Terry Garmey Speaks About Tucker Smith and the Campaign to Repair 4,000 Guards on OTIS Elevators; Smith Elliott Smith & Garmey; <http://www.fairwarning.org/wp-content/uploads/2013/12/TuckerSmithArticle.pdf>

⁶ Terry Garmey Speaks About Tucker Smith and the Campaign to Repair 4,000 Guards on OTIS Elevators; Smith Elliott Smith & Garmey: <http://www.fairwarning.org/wp-content/uploads/2013/12/TuckerSmithArticle.pdf>

the ASME Standard. A child or small adult can fit into those valleys, and when the hoistway (exterior) door is closed and the elevator moves, they can be seriously injured or killed. Some elevator designers, installers and others purportedly following the ASME A 17.1 5-inch rule do not take into account the extra space created by the valleys, which, in effect, can increase the gap by an additional three inches or more.

In 2003, the Otis Elevator Company, as part of a settlement with the family of an eight-year-old boy who died after becoming entrapped between elevator doors, launched a national safety campaign, equipping 4,000 elevators with space guards. Otis also sent letters to other manufacturers urging them to check the size of the gap between elevator doors and offered free space guards for Otis-manufactured elevators:⁷

Over the years, a number of tragic accidents have occurred on elevators with swing-type hoistway doors, including the deaths of numerous children. These accidents have demonstrated the safety risk posed by elevators with swing doors. If the hoistway door and car gate are both closed, the space between them would be wide enough to fit a child or small adult. Should the elevator be called up while the person is in that space, serious injury or death is likely to result. These tragedies can be avoided.⁸

In addition, Otis' Director of Worldwide Standards, Lou Bialy, highlighted the danger posed by this defect in a trade publication, *Elevator World*, entitled *Space Between Swing Doors Collapsible Gates Still A Hazard*.⁹ As recently as March 2014, elevator experts James Filippone and John Koshak reiterated the dangers of child entrapment in another *Elevator World* article entitled *Solutions Needed to Ensure Children's Safety*.

Safer and Feasible Alternative Designs

Safer design options reduce the gap between the hoistway and car doors. Such designs recognize the ergonomic factors that contribute to the hazard. For example, as the CPSC's own anthropometry data show, children's heads are larger than their bodies, and the most vulnerable children, ages 2-3.5 years, have head breadths of less than five inches.¹⁰

The CPSC and others have identified 4 inches as a key element of safe design in other contexts, such as the allowable space between staircase spindles, specifically to prevent head entrapment.¹¹ The CPSC's Public Playground Safety Handbook recommends a more conservative maximum allowable gap of 3.5 inches, specifically to prevent a child's

⁷ Letter to National Wheelovator; Raymond Moncini; Otis Elevator Company; December 8, 2003

⁸ Letter to National Wheelovator; Raymond Moncini; Otis Elevator Company; December 8, 2003

⁹ *Space Between Swing Doors Collapsible Gates Still A Hazard*; Lou Bialy; *Elevator World*; May 2003

¹⁰ *Change in the Physical Dimensions of Children in the United States*; U.S. Consumer Product Safety Commission; April 27, 1998

¹¹ *Ergonomics and Design Review*; Rani Leuder; *Helvey v. ThyssenKrupp Access Corporation*; October 22, 2012

head from entering the space and becoming entrapped.¹²

In addition, history shows that the design alternatives are feasible. From 1955, when ASME's first residential elevator code was published, until 1980, when the dimension was changed, the voluntary industry standard called for a maximum gap of 4 inches between the two doors.

Individual states have more stringent standards than those set by ASME. Massachusetts' elevator code, for example, restricts any gap between the hoistway doors and the car doors or gates to 3 inches.¹³ In the state of Georgia, an effort to follow suit is underway. The amendment to the International Residential Code proposed by the State Fire Marshal's office, which oversees elevator codes, reads:

Passenger elevators, limited-use/limited-application elevators or private residence elevators shall have hoistway landing openings that meet the Georgia amended requirements of ASME A17.1 Sections 5.3.1.1 and 5.3.1.7.2. The clearance between the hoistway doors or gates and the hoistway edge of the landing sill shall not exceed 3/4 inch (19 mm). The distance between the hoistway face of the landing door or gate and the car door or gate shall not exceed 3 inches (75 mm).¹⁴

This change is scheduled to be finalized by the Georgia Department of Public Affairs in November and go into effect in January 2015.

A reduction of the clearance is feasible because it does not change the manufacture of the elevator itself; rather it guides the installation of the hoistway door. Currently, in residential settings, the exterior door is typically set flush to the wall, like any other door in a home. This setting typically creates the excessive gap. Installers can exacerbate the gap by misinterpreting the 5" Rule in the voluntary standard as measuring the distance between the *closest* points between the doors, rather than the furthest point. In fact, manufacturers' designs often instruct installers to measure between the hoistway door and the peak of an accordion car door, rather than to the valley. Those who do not take into account the extra space beyond the peak of the accordion door can create up to 8 inches of refuge space, which permits entry by a child.

Voluntary Standards Have Not Prevented Risk of Harm

In 83 years, the industry not only has failed to address the entrapment hazard, it actually increased the potential for injury and death by re-writing the voluntary standard to allow a wider gap between the hoistway and exterior door.

¹² Public Playground Safety Handbook; U.S. Consumer Product Safety Commission; undated

¹³ 5.3.1.7.2 Clearance Between Hoistway Doors or Gates and Landing Sills and Car 'Doors or, Gates; 5.3.1.7 Protection of Hoistway Openings.; 524 CMR Board of Elevator Regulations; PDF Pg. 214; September 28, 2012

¹⁴ Georgia State Amendments to the Residential Elevator Codes for One and Two-Family Dwellings; August 13, 2014

The voluntary ASME standard has failed to safeguard children from injuries and deaths. According to CPSC's own figures, there were an estimated 1600 injuries associated with residential elevators in just a two-year period.

The most recent figures from CPSC's NEISS system show that an estimated 1,600 injuries associated with residential elevators and lifts were seen in emergency departments from 2011 through 2012. CPSC only has jurisdiction over elevators customarily used by consumers in a residential setting. Some of those injuries included children becoming entrapped in the gap of residential elevators, tragically leading to fatalities and serious injuries. The agency has an active and ongoing compliance investigation regarding the safety of residential elevators and the entrapment hazard they can present. While CPSC investigates the role and responsibilities of manufacturers and installers when it comes to the safety of residential elevators, owners of residential elevators should take steps to ensure children do not have unsupervised access to in-home elevators.¹⁵

In addition, the entrapment hazard has led to a number of child deaths. In the early 1990s, the Otis Elevator company revealed to the plaintiffs in a New Jersey case the deaths or severe injuries to 34 children from 1983-1993 in the southern New York and New Jersey area alone¹⁶ and an additional 16 deaths from 1947 to 1963.¹⁷ More recently, the petitioners are aware of five more deaths and two catastrophic injuries in which children were entrapped and crushed in residential elevators.¹⁸

The ASME Voluntary Standards Process Has Been a Failure

The ASME standards-setting process has not produced a substantive change to the voluntary residential elevator standard in nine years of committee meetings, despite members repeatedly bringing up the excessive gap issue.

In 2005, the A-17 committee began discussing revisions to the "Clearance" section of the standard. Several members of the A-17 Committee lobbied to change the Clearance dimensions of the standard back to the original dimensions. Minutes of the committee meetings between September 2006 and June 2007 show that some committee members expressed concern about the hazardous gap permitted by the standard. However, the group rejected any proposals for revising the standard to require tighter clearances and more precisely described measuring points to ensure that home elevators would comply.¹⁹

¹⁵ Email to The Safety Record Blog; Scott Wolfson; US Consumer Product Safety Commission ; August 27, 2013

¹⁶ The Elevator Design Hazard That's Been Killing Children for Decades; The Safety Record Blog; July 11, 2013

¹⁷ Elevator Safety Flaws Persist, Despite History of Tragic Accidents; Shawn Hubler; Fair Warning; December 8, 2013

¹⁸ Appendix A; Elevator Entrapment Deaths and Injuries

¹⁹ A17 Residence Elevator Committee; Minutes; September 19, 2006- June 18, 2007

For example, Calvin Rogler, chief of the state of Michigan's Elevator Safety Division, suggested that the language be modified to only allow for a 4-inch clearance, because when accordion doors are used, the clearance from the face of the hoistway door to the furthest part of the accordion door resulted in a clearance of 5.5-inches. At one such meeting, he said "The clearances between the car and the hoistway door must be reduced to provide an acceptable level of safety for the families using this device. Accidents dealing with this area have been deadly."²⁰

Another committee member, Richard Gregory, an elevator consultant, described an incident that occurred in Michigan in which a 10-year-old boy who had slipped between the hoistway door and the accordion door was fatally crushed when the lift was called to a floor below. It would be easy to reduce clearances in elevators with wide gaps with products readily available on the market, he said in an email to the committee chairman.²¹

"It's easy, it saves lives. So it should be done," Gregory wrote.²²

Despite repeated attempts to persuade the majority of members that the excessive gap was a serious safety problem that resulted in a child's death, the committee decided that the status quo should remain: "The committee feels assured that the measurement criteria presented will provide for adequate safety. In addition, the 5-inch dimension has been in the standard for many years."²³

Not only has the subcommittee failed to revise the standard in order to adequately address this hazard, they recently considered making the Clearances section of the standard even more lenient. At the first quarterly meeting of 2013, the committee was poised to codify the latest revisions, which included measuring instructions that would have allowed designers to consider the shortest point when measuring the clearance, instead of the farthest point. Fortunately, a member of the larger standards committee made an impassioned and successful plea to reject the change.

More recently, the committee shelved a proposal to reduce the gap between the doors on existing elevators to a 4-inch maximum, while it awaits the results of an internal hazard analysis. Although the A17 committee had been looking at this issue since 2005, they just voted to perform a hazard analysis last year. The committee also weighed a proposal to clarify the rule and make explicit that the 5-inch maximum dimension/constraint must be measured between the farthest points between the doors – not the closest. Even if the Committee immediately approved both, any rule change is effectively delayed for another three years, when the next edition of the Elevator Safety Code is published.

²⁰ A17 Residence Elevator Committee; Minutes; September 19, 2006- June 18, 2007; Carl Rogler; PDF Pg. 10; Responses to Letter Ballot #05-1123 Comments; November 28, 2005

²¹ Accordion Door Accident; email; Richard Gregory to Al Vershell; June 27, 2006

²² Accordion Door Accident; email; Richard Gregory to Al Vershell; June 27, 2006

²³ A17 Residence Elevator Committee; Minutes; September 19, 2006- June 18, 2007; Carl Rogler; PDF Pg. 10; Responses to Letter Ballot #05-1123 Comments; November 28, 2005

We have no reason to believe that will happen. Nine years have elapsed since the ASME committee first considered modifying requirements for clearances. To date, the standard still has not been revised to effectively address the hazard. Clearly, industry has demonstrated its unwillingness to correct the problem on its own and there is insufficient industry buy-in supporting the change. For example, when one member suggested amending the rule to reflect that the measurements should be taken from the farthest points, it was rejected: "The Committee feels assured that the measurement criteria presented will provide for adequate safety."²⁴ In another instance, a small group within the committee voted against the proposed rule, with one member arguing: "Those clearances between the car and hoistway doors must be reduced to provide an acceptable level of safety for the families using this device. Accidents dealing with this area have been deadly for those involved."²⁵ Even when confronted with the history of child deaths, the response was: "The committee feels assured that the measurement criteria presented will provide for adequate safety. In addition, the 5"inch dimension has been in the standard for many years."²⁶

More importantly, even if ASME A17 amends the rule, its adoption is not automatic. Any jurisdiction (whether city, county or state) may adopt any version of the A17 Elevator Safety Code. Many jurisdictions are decades behind. For example, some states today use the 2004 or older versions, even though there have been many subsequent versions. Other jurisdictions, such as South Carolina, do not have any code for residential elevators and do not require permitting or inspections for single family residential elevators. Children represent a vulnerable population who need the protection of a strong mandatory standard when the voluntary standards process has repeatedly failed to offer reasonable and feasible protections against potentially grievous injury.

The ASME's standard-setting process, unfathomable delays and rationale for rejecting proposed changes is at odds with the purpose of developing a safety standard. Industry's inaction is even more egregious given that methods for addressing the hazard are technologically and economically feasible and have been for many years. Further, to conclude that a standard should not be changed simply because it has existed for many years is not the result of a credible standards-writing process.

Ironically, the elevator industry has launched the homeSAFE (Safety Awareness for Elevators) Campaign, to increase home elevator safety awareness. The campaign is sponsored by Association of Members of the Accessibility Equipment Industry (AEMA), National Association of Elevator Contractors (NAEC), National Association of Elevator Safety Authorities International (NAESA) and ThyssenKrupp Access. The HomeSAFE Campaign recommends that homeowners make sure the gap between the accordion and swing doors be no more than 4 inches, even as the ASME committee refused to codify this advice into its own standards:

²⁴ TN05-803 Residence Elevator Committee; Attachment 8C; Pg. 5

²⁵ TN05-803 Residence Elevator Committee; Attachment 8C; Pg. 6

²⁶ TN05-803 Residence Elevator Committee; Attachment 8C; Pg. 6

Measure the gap between the elevator door and the hoistway door to verify it is not wide enough for a child to become entrapped. ASME Codes require the space be no more than 5 inches; but for additional safety precautions, homeSAFE recommends the space between the hoistway door and cab gate is no more than 4 inches. Features such as space guards or special hoistway doors can help reduce the space between the elevator door and the hoistway door. Other safety devices such as light curtains also may help detect someone in the space between doors.²⁷

Petition Request

The Petitioners hereby formally submit this Petition for Rulemaking under the authority and process set forth in 16 CFR § 1051 Procedure for Petitioning for Rulemaking and request the Commission to promulgate a mandatory standard that constrains the space between residential elevator hoistway doors and car doors/gates to 4 inches when measured from the inside of the hoistway door to the farthest point on the car door/gate (*i.e.*, the valley for an accordion door).

Under Sec. 9 [15 U.S.C. § 2058] Procedure for Consumer Product Safety Rules, the Commission must meet certain criteria to commence a rulemaking: identify the product and the risk of injury associated with that product, ensure a rule is in the public interest, and consider the adequacy of any already existing voluntary standard in eliminating or adequately reducing an unreasonable risk.

The petitioners believe that the record clearly establishes the hazard – the entrapment risk posed by excessive space between the inner and outer elevator doors; the significant risk of injury and fatality; and the failure of the voluntary standard to mitigate or eliminate the hazard despite the feasibility of a technical fix.

To ensure the safety of existing elevators, the Petitioners also request that the Commission commence a recall to repair, requiring all manufacturers to retrofit existing elevators to prevent children and small adults from becoming entrapped. Several technologies exist to eliminate this hazard. For example, light curtains use light beams and sensors to detect a presence between the doors and interrupt the operation of the elevator if something or someone is in this space. This would prevent the scenario of the elevator car being called to another floor while a child is entrapped between the car door/gate and the hoistway door. Door baffles (or space guards) are another potential solution. These after-market space blockers fill the excess clearance space, removing the opportunity for children or small adults to fit themselves in the space between the car and hoistway doors.

The Petitioners appreciate the Commission's consideration of this request. We are available to discuss this petition at your convenience.

²⁷ <http://homesafecampaign.com/safe-home-elevator-installation/>

Respectfully submitted,

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Interest of Petitioners

This petition is brought by three organizations on behalf of all children and their families affected by residential elevators:

The Safety Institute is a 501 (c) 3 non-profit organization whose focus is on injury prevention and product safety. The Safety Institute examines areas of injury prevention and product safety across a broad spectrum. The Institute bases its plans and priorities on issues that require greater study and emphasis, as well as those which may be underserved by other organizations and advocates. The Institute gives special attention to those areas of emerging importance to injury and product safety, including the effects of new and changing technologies.

Independent Safety Consulting (ISC), through its principal, Carol Pollack-Nelson, provides human factors consulting specializing in consumer product safety, by evaluating product designs, warnings and instructions in order to identify hazards and reduce risks to consumers. Ms. Pollack-Nelson was a Human Factors Psychologist at the CPSC from 1988 through 1993.

Cash, Krugler & Fredericks, LLC is a law firm representing victims and their families in cases involving catastrophic injury and death. The firm pursues this petition on behalf of the families with whom they have worked whose children have suffered brain injuries, paralysis and other disabilities due to residential elevator hazards.

Appendix A

Elevator Entrapment Deaths and Injuries

According to CPSC statistics, there were an estimated 1,600 injuries associated with residential elevators in a two-year period. The following incidents are a small sample of the injuries and deaths:

**1958: Three-year-old girl died, caught between the inner grill and outer door
San Francisco, California**

- The three-year-old girl ran ahead to press the button for the automatic elevator as her babysitter prepared to leave;
- The elevator arrived at the fourth-floor and the outside door opened. The girl was caught between the inner grill and outer door, which closed behind her;
- Somebody pressed the button on another floor and the young girl was crushed to death.¹

**1961: Seven-year-old boy died, crushed when he became wedged between the
elevator door and the gate
Red Bank, New Jersey**

- The seven-year-old boy who may have been playing or hiding from a playmate when the incident occurred, became wedged between the elevator door and the gate;
- The boy's body was found wedged in the space between the door and the gate of the elevator, which was stuck between the third and fourth floors of the apartment building.²

**1962: Three-year-old girl died, caught between the wall and the moving elevator
Brooklyn, New York**

- Three-year-old girl was crushed to death between the wall and the moving elevator;
- Police said the victim somehow managed to get the inner door open and took hold the fourth-floor outer door as the self-service elevator descended in a Brooklyn apartment.^{3,4}

¹ Charleston Daily Mail, Thursday, May 8, 1958, Page 1; <http://newspaperarchive.com/us/west-virginia/charleston/charleston-daily-mail/1958/05-08/>

² Red Bank Register, Tuesday September 5, 1961; <http://209.212.22.88/data/rbr/1960-1969/1961/1961.09.05.pdf> (Page 2)

³ Manitowoc Herald Times, Thursday, May 24, 1962, Page 17; <http://newspaperarchive.com/us/wisconsin/manitowoc/manitowoc-herald-times/1962/05-24/page-17>

⁴ Toledo Blade, May 23, 1962; <http://news.google.com/newspapers?nid=1350&dat=19620523&id=RbxOAAAIAIAJ&sjid=MgEEAAAAIAIAJ&pg=6627,511812>

1976: Seven-year-old boy died, trapped between the outer door and the wall of the elevator shaft

Newark, New Jersey

- The seven-year-old boy became trapped in the building's elevator between its outer door and the wall of the elevator shaft;
- The elevator was activated and the boy was dragged up to the third floor;
- Another child who was racing up a nearby stairway to beat the elevator opened it, saw the victim wedged within it, and ran to seek help;
- Rescue workers worked for four and one-half hours to free the child; he died while still trapped.⁵

1977: Ten-year-old girl; crushed in an elevator between the hoist way door and the gate

Yonkers, New York

- Ten-year-old girl was crushed in an elevator between the hoistway door and the gate.⁶

1980: Seven-year-old boy sustained broken leg, bruising and scarring

Newark, New Jersey

- The seven-year-old boy was getting out of the elevator at a basement landing when he found himself trapped as the car gate closed behind him and the hoistway door was not open;
- Someone else called the car, and it ascended with the young boy stuck between the car gate and hoistway door.⁷

1986: 12-year old boy died, trapped between elevator door and swing gate

Newark, New Jersey

- The 12-year-old boy became wedged between the swing hatch door and the elevator car gate;
- The elevator received an up call and traveled away from the basement landing, crushing the child between the wall immediately above the basement door header and the 2nd landing sill and leading edge of platform with toe guard.⁸

⁵Portee v. Jaffee | Leagle.com;

http://leagle.com/decision/198017284NJ88_1169.xml/PORTEE%20v.%20JAFFEE

⁶The Herald Statesman, August 20, 1978;

<http://fultonhistory.com/newspaper%2010/Yonkers%20NY%20Herald%20Statesman/Yonkers%20NY%20Herald%20Statesman%201978%20Grayscale/Yonkers%20NY%20Herald%20Statesman%201978%20Grayscale%20-%206052.pdf>

⁷Liberty Mutual, accident report, December 9, 1980

⁸Otis Elevator company, accident report, April 14, 1987

**1997: Four-year old girl died, caught between floors in a residential elevator
Chicago, Illinois**

- Four-year-old girl was caught between the floors of an elevator in a residential building;
- Her mother had gotten off before her and the other children pressed the call button.⁹

**2001: Eight year-old boy died, entrapped between swing door of residential elevator
Bethel, Maine**

- The 8-year-old boy pushed the call button and opened the swinging door; the door closed behind the boy; before he could open the collapsible gate a maid on the second floor pushed the call button, interlocking the outer door and trapping the child in the gap between the outer swing door and collapsible gate;
- The young boy was nearly decapitated and died in front of his family;
- The distance between the outer swing door and collapsible gate was seven inches.
- Otis settled and sent notices to the elevator industry about the hazard.^{10,11}

**2002: Two sisters, ages six and seven died, heads crushed in residential elevator
Monmouth County, New Jersey**

- Two girls were lying down in the elevator with their heads partly across the threshold as the car rose;
- The safety feature was disabled allowing it to descend while the girls' heads stuck out past the gate;
- They died when their heads were wedged against part of the shaft.¹²

⁹ CPWR Deaths and Injuries Involving Elevators and Escalators, September 2013; http://www.cpwr.com/sites/default/files/publications/elevator_escalator_BLSapproved_2.pdf (Page 23)

¹⁰ Space Between Swing Doors Collapsible Gates Still A Hazard; Lou Bialy; Elevator World; May 2003

¹¹ Terry Garmey Speaks About Tucker Smith and the Campaign to Repair 4,000 Guards on OTIS Elevators; Smith Elliott Smith & Garmey; <http://www.fairwarning.org/wp-content/uploads/2013/12/TuckerSmithArticle.pdf>

¹² Asbury Park Press, August 2, 2002; <http://house.michigan.gov/sessiondocs/2013-2014/testimony/Committee238-9-24-2013.pdf>

2003: Ten-year-old boy died, entrapped and crushed in swing door of residential elevator equipped with an accordion door

Mass City, Michigan

- The ten-year-old boy got caught between the hoistway door and the accordion door;
- The elevator started going down crushing the boy who then suffocated;
- The distance to the peak of the accordion door was approximately 5", but valleys were much deeper;
- The family's expert notified ASME A17 Residence Elevator Committee of this incident in 2006.¹³

2004: Five-year-old boy died, crushed between elevator door and hoistway door

Dallas, Texas

- The five-year-old boy entered the elevator with his two-year-old brother in their family's multistory condominium;
- The accordion-style gate was not closed, allowing the boy's body to be extended outside the door as the elevator started moving up;
- As the elevator ascended, his head was crushed by the second floor landing.^{14, 15}

2006: Eleven-year-old girl died, entrapped between the elevator and shaft walls

Carolina Beach, North Carolina

- The 11-year-old girl was thought to have entered and exited the elevator with another child;
- The owner of the residence went to use the elevator and was unable to open the door;
- The fire department was notified and upon responding and opening the downstairs elevator found the girl pinned in the elevator shaft between the elevator and shaft walls.¹⁶

¹³ ASME A17 Residence elevator committee 2006 meeting minutes

¹⁴ The Dallas Morning News, Sunday June 20, 2004, Page 3B;

<http://newspaperarchive.com/us/texas/harlingen/valley-morning-star/2004/06-20/page-3>

¹⁵ The Dallas Morning News, Saturday June 19, 2004, Page 2B;

¹⁶ Carolina Beach Police Department, North Carolina, Incident/Investigation report July 23, 2006

2009: Nine-year-old boy died, pinned in an elevator shaft between the wall and the door

Sturgis, Kentucky

- A nine-year-old boy attending his grandmother's wedding ceremony died when he became pinned in a church elevator shaft;
- He wandered off by himself and was riding the elevator in the church sanctuary between the first and second floors;
- He became pinned between the elevator and the wall; there were no witnesses.¹⁷

2010: Three-year-old boy suffered catastrophic brain injury, entrapped between hoistway door and accordion door

Cummings, Georgia

- The three-year-old boy was entrapped between the hoistway (exterior) door and elevator accordion door;
- After child closed the hoistway door, the door automatically locked by way of an interlock;
- When mother hit the call button from the 3rd floor, the child was trapped in this space; the elevator rose toward the third floor and then stopped and re-leveled;
- The child was crushed by the elevator when it re-leveled down to the second floor;
- The distance between the hoistway door to accordion door varied by nearly 3";
- 4.875" to tip of the accordion door / 7.5" to valley of the accordion door;
- Injuries are catastrophic and permanent. Child diagnosed with an anoxic brain injury due to deprivation of oxygen for an extended period of time; he cannot communicate with the outside world or move in any meaningful way;
- This incident was reported to the CPSC on December 7, 2012.¹⁸

¹⁷ Evansville Courier & Press, June 13, 2009; <http://www.courierpress.com/news/local-news/child-crushed-sturgis-ky-church-elevator>

¹⁸ Jacob Helvey, Elevator Incident report date, December 7, 2012; <http://www.saferproducts.gov/ViewIncident/1289132>

**November 2013: Ten-year old boy suffered catastrophic brain injury and quadriplegia, entrapped and pinned under elevator car
Murrells Inlet, South Carolina**

- Ten-year-old boy suffered a catastrophic brain injury when he became trapped in an Elmira residential elevator manufactured by Cambridge Elevating, Inc. out of Cambridge, Canada;
- As the elevator began to rise with the car gate open, the child peered over the edge of the car platform and down into the elevator shaft;
- As the car continued to rise, the child's head came into contact with the doorframe, pinning his head under the elevator car;
- The car continued to rise up to the third floor, where the child was found laying face down on the floor of the elevator car with his head and neck trapped under the car platform;
- The jaws of life were eventually required to rescue the child from the elevator;
- In addition to multiple fractures, he suffered catastrophic brain injury.¹⁹

¹⁹ Jordan Nelson Elevator Incident report date September 5, 2014;
<http://www.saferproducts.gov/ViewIncident/1427183>