

**From:** [Kempske, Rebekah](#)  
**To:** [Genevieve Lynn](#)  
**Cc:** [Voluntary Standards](#); [Nelson, Michael](#)  
**Subject:** CPSC Staff Letter - Accessible Pool Piping Entrapment  
**Date:** Wednesday, May 29, 2024 3:54:27 PM  
**Attachments:** [CPSC Staff Letter to PHTA 5-29-24.pdf](#)

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Hello Genevieve,

CPSC staff are concerned with recent deaths and injuries associated with accessible pool piping and pool pump suction pressure that can cause limb or body entrapment. Please see the letter attached for additional information regarding the concerns.

Staff looks forward to collaborating with PHTA on these efforts and if you have any questions, please feel free to contact me.

Thank you,  
Rebekah Kempcke

## **Rebekah Kempcke**

**Mechanical Engineer**

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May 29, 2024

Genevieve Lynn  
Program Director, Standards & Technical Services  
Pool & Hot Tub Alliance  
1650 King St., Ste. 602  
Alexandria, VA 22314

Dear Ms. Lynn:

U.S. Consumer Product Safety Commission (CPSC) staff<sup>1</sup> requests that the Pool & Hot Tub Alliance (PHTA) form a working group to develop or amend a voluntary standard(s), as appropriate, containing performance requirements to reduce the risk of death and injury due to hazards associated with entrapment and drowning in bather-accessible pool piping. Staff are concerned with recent deaths and injuries associated with accessible pool piping and pool pump suction pressure that can cause limb or body entrapment.

The concern is highlighted by the recent death of an 8-year-old girl who was found in the exposed discharge pipe in a “lazy river” at a hotel pool in Houston, Texas on March 23, 2024.<sup>2</sup> Staff is concerned that it is possible that a pump motor, operating through a motor controller interface, could operate in reverse and draw a person into an exposed discharge pipe. Media reports about the Houston incident and general engineering judgment indicate the possibility of grave risk in the lack of shielding of a consumer from this entrapment hazard. Staff recommend PHTA quickly adopt requirements in APSP-16 2017<sup>3</sup> or PHTA-7 2020<sup>4</sup>, as appropriate, that at minimum require physical barriers to limb/body entrapment in discharge piping or require pumping systems that cannot reverse the normal flow direction. With additional discussion on the potential hazard of a bather becoming entrapped in large discharge piping when the pumping system is off.

In addition, some low- or no-pressure pipe openings in pool walls, such as skimmer equalizer lines, have no federal drain cover requirements, but do pose limb entrapment hazards. Staff appreciates that PHTA-7 2020 requires that skimmer equalizer lines not be used in new construction and that existing equalizer lines have a VBGA-listed cover. Staff believes that PHTA-7 2020 adequately addresses the hazards posed by skimmer equalizer lines.

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<sup>1</sup> The comments in this letter are those of the CPSC staff and have not been reviewed or approved by, and may not necessarily reflect the views of, the Commission.

<sup>2</sup> [News report of drowning death of girl in Houston, Texas.](#)

<sup>3</sup> ANSI/APSP/ICC-16 2017 (PA) Standard for Suction Outlet Fitting Assemblies

<sup>4</sup> ANSI/PHTA/ICC-7 2020 Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins



Staff have additional concerns with body and limb entrapment hazards in pipe openings inside large pool drain sumps. Large sump openings that the adult human body cannot block are defined as “unblockable” and do not require one of the secondary safety systems listed in the *Virginia Graeme Baker Pool and Spa Safety Act* (VGBA). However, if an unblockable drain cover is damaged or missing, bathers can enter the unblockable sump, and their body can be drawn into the exposed and unguarded suction piping. Sump and wall piping entrapments are examples of hazards that exist when specific circumstances arise that remove a layer of safety.

Staff recommends that APSP-16 and/or PHTA-7 be amended to add requirements that include:

1. For each pool and spa with suction outlets, the uncovered and bather-accessible discharge pipe openings shall be equipped with a minimum of one of the following devices or systems to prevent limb and body entrapment on or into pipe openings larger than 1-inch:
  - a. Physical barriers that prevent the penetration of the end of a 1-inch diameter steel cylinder into the pipe and comply with the Physical Testing in APSP-16 2017 performance standard.<sup>5</sup>
  - b. Anti-entrapment devices or systems that comply with the APSP-16 2017 performance standard.
  - c. Systems and/or components that prevent backflow when the intended direction of water flow is reversed.<sup>6</sup>
  - d. A pumping system that cannot be physically<sup>7</sup> or electrically<sup>8</sup> configured, or otherwise controlled, to reverse the intended direction of water flow.
  - e. Any other system that is equally effective as, or better than, the systems described in paragraphs a – d.

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<sup>5</sup> APSP-16 2017, Section 7.3.1 *Aperture size* requires that the 1-inch cylindrical end of the “UL Articulated Probe” cannot be made to penetrate through to the inside surface of any aperture in the drain cover. Section 4 *Physical Testing* has test methods to assess the durability of the drain cover and fasteners under various loads.

<sup>6</sup> Systems and/or components include, but not limited to, inline check valves or a motor control system that detects a reversal of rotation, defaults to a safe mode, and then alerts the user.

<sup>7</sup> A pumping system that has no interconnections between suction and discharge piping anywhere along the pipes, including at the pump, and cannot be physically configured to reverse the flow direction without violating this requirement.

<sup>8</sup> A pumping system that has a motor that cannot be made to run in reverse by switching electrical terminals, mis-installation of components, or other such actions.



2. Each pool and spa with anti-entrapment drain covers or suction outlets that are the subject of APSP-16 2017 shall be equipped with a minimum of one of the following devices or systems to prevent limb and body entrapment on or into any pipe opening that is bather-accessible after the removal of the drain cover:
  - a. Physical barriers that prevent the penetration of the end of a 1-inch diameter steel cylinder into the pipe and that comply with the Physical Testing in APSP-16 2017 performance standard.
  - b. Anti-entrapment devices or systems that comply with the APSP-16 2017 performance standard.
  - c. Any other system that is equally effective as, or better than, the systems described in paragraphs a – b.

In closing, CPSC staff requests that PHTA form a working group to quickly amend APSP-16 and/or PHTA-7 to address these hazards specifically and/or develop additional voluntary standards containing performance requirements to reduce the risk of death and injury due to hazards associated with any exposure to the bather of pool piping that can cause limb or body entrapment.

Sincerely,

*Rebekah Kempcke*

Rebekah Kempcke  
*Mechanical Engineer*  
*Directorate for Laboratory Sciences*

CC: Jacqueline Campbell, CPSC Voluntary Standards Coordinator