

simple safety

Five Categories of Entrapment

1. Hair Entrapment (40 incidents) occurs when long hair passes through a suction outlet cover and then entangles beyond the cover locking the head to the cover. High water velocity and long hair length increase the possibility that entanglement and entrapment occurs.
2. Limb Entrapment occurs when the cover is missing or broken and a limb (leg, arm, knuckle, finger, or toe) is held within the plumbing due to the suction and/or physically getting the limb stuck.
3. Body Entrapment occurs when the body is held against a suction outlet and forms a seal.
4. Evisceration/Disembowelment occurs when a buttocks seals a suction outlet causing the rectum to burst and viscera to be withdrawn from the body.
5. Mechanical Entrapment occurs when something attached to the bather (necklace, bathing suit, etc.) tangles with a structure below the water.

More Information

The CPSC is developing guidelines to prevent entrapment entitled, "DRAFT Guidelines for Entrapment Hazards: Making Pools and Spas Safer."

The document can be viewed at www.nspf.org/CPSC_Pool_and_Spa_Draft.pdf where there are instructions on how to comment to the CPSC. The Foundation will continue to monitor and provide information on ways to minimize entrapment as it becomes available.

Protecting Bathers by Preventing Entrapment

The Consumer Product Safety Commission (CPSC) has documented 126 entrapment cases over a thirteen-year period (1/90–10/03). These incidents resulted in 25 deaths (11 due to hair entrapment and 14 due to limb or body entrapment). These cases can be broken down into five different categories (see sidebar at left).

Additional incidents may have occurred but have not been identified by the CPSC. The NSPF® is committed to working with government and industrial groups to protect the public by minimizing any chance of entrapment in pools and spas.

NSPF Certified Pool and Spa Operators® should perform careful inspections to ensure that facilities minimize the risk of entrapment. Pay particular attention to wading pools and spas since the shallow water depth creates a greater risk because the suction outlets (main drains) are closer to the bathers.

Prevention is most important in protecting against entrapment. Operators must ensure that protective covers are properly installed and operating.

To minimize the five forms of entrapment:

- No pool or spa should be operated if any of the covers of the suction outlets including main drains are missing, damaged or not secured. This rule should be monitored throughout the season.
- Drain covers should display markings for maximum flow rate, model number and a statement indicating

that a third party has tested and certified that the cover complies with the ASME/ANSI Standard A112.19.8M, "Suction Fittings for Use In Swimming Pools and Wading Pools, Spas, Hot Tubs and Whirlpool Bathtub Appliances."

- These covers should be installed so that the maximum flow rating is not exceeded to prevent entrapment or long hair from entangling in the cover.

Entrapment can be further minimized by other design criteria. Dual main drains reduce the risk of entrapment when plumbed and spaced at a sufficient distance apart to ensure that an individual can not block both drains. The drains must be maintained to avoid blockage. Fit main drains with "anti-entrapment covers" that have sufficient size to not permit the torso and arms to block the cover. Some systems remove direct suction outlets from the pool or spa by using a gutter system or a surge tank (gravity systems).

Properly engineered and maintained atmospheric vents can further minimize risk by breaking the vacuum at a suction outlet once entrapment occurs. Alternatively, manufactured Safety Vacuum Release Systems (SVRS) in compliance with the ASME/ANSI A112.199.17, "Safety Vacuum Release Systems for Swimming Pool Suction Fittings and Drains" may provide additional protection against certain forms of entrapment when installed and maintained according to the manufacturer's specifications.