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In 2016 there were more than 50 documented drownings at dams in the United States, and many more near misses or serious incidents that almost led to tragedy. The increasing number of incidents from hydraulic hazards at dams is a disturbing trend. According to Dr. Bruce Tschantz, professor emeritus at the University of Tennessee and long-time researcher involved in monitoring incidents at dams, over the past 20 years there have been more than 10 times as many fatalities from hydraulic hazards at dams than there has been from dam failures. Examination of these incidents shows that the vast majority were the result of transient hydraulic conditions that were not identified or addressed by the dam owner. In other words, the hazardous hydraulic condition did not normally occur at the dam, but occurred unexpectedly as a result of sudden operational or hydrologic circumstances.

The purpose of this paper is to provide descriptions of the seven primary hydraulic hazards at dams that have resulted in loss of life. Fortunately much can be done to successfully mitigate these hazards. A brief discussion of effective strategies to mitigate each hydraulic hazard is provided. The information included in this paper is intended to help dam owners, regulators and designers become aware of the hydraulic hazards at dams and develop successful mitigation strategies to address each hazard.