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FACE

Fatality Assessment and Control Evaluation Program

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Seventeen-Year-Old Lifeguard Dies After Falling Into a Nearly Empty Swimming Pool - Pennsylvania

SUMMARY

On May 27, 2000, a 17-year-old female lifeguard (the victim) died after she fell into a nearly empty swimming pool. On the day of the incident, a crew of four, including the victim, two other lifeguards, and the pool engineer were preparing the pool for the new season. One lifeguard and the pool engineer were working in the filter room while the victim and another lifeguard (coworker) were in the pool, cleaning the floor and sides of the L-shaped pool. The coworker was cleaning the pool at a location where he could not see the victim, when he heard a "thump." He looked up and observed the diving board, which had been placed on its rack the previous day but not secured, falling into the pool. He ran around the corner of the L-shaped pool and saw the victim laying face down in several inches of water in the deepest part of the pool (11 feet, 6 inches deep). The coworker turned the victim faceup to prevent her from drowning, moved her out of the water toward the west end of the pool where the pool was less steeply sloped, and called out for help. He stayed with the victim until help arrived. The lifeguard and the pool engineer heard the coworker's call for help and immediately called 911, then went to help the victim. Police and fire department personnel responded within 2 minutes. They determined that the victim had a pulse and respirations and severe head injuries and immediately called for an ambulance. The victim was taken by ambulance to an area hospital and then flown to a regional trauma center where she was pronounced dead 3 days after the incident.

Community Pool Where Incident Occurred

Fatality Assessment and Control Evaluation (FACE) Project

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatality Assessment and Control Evaluation (FACE) investigations when notified by participating states (North Carolina, Pennsylvania, South Carolina, Tennessee, and Virginia); by the Wage and Hour Division, Department of Labor; or when a request for technical assistance is received from NIOSH-funded state-level FACE programs in Alaska, California, Iowa, Kentucky, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin. The goal of these evaluations is to prevent fatal work injuries in the future by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. The FACE program does not seek to determine fault or place blame on companies or individual workers. For further information visit the FACE website at **www.cdc.gov/niosh/face/faceweb.html** or call toll free 1-800-35NIOSH.

NIOSH investigators concluded that, to help prevent similar occurrences, employers should

- ***complete a hazard assessment that identifies hazards present during seasonal pool maintenance, and then develop, implement, and enforce standard operating procedures (SOPs) that, when followed, eliminate hazards or minimize worker exposure to risk of injury***

- ***train all workers to recognize the hazards identified in the hazard assessment and train them to follow standard operating procedures (SOPs) designed to minimize their risks***

INTRODUCTION

On May 27, 2000, a 17-year-old female lifeguard (the victim) died after she fell into a nearly empty swimming pool. On May 31, 2000, officials of the Wage and Hour Division of the U.S. Department of Labor notified the Division of Safety Research (DSR) of this fatality. On June 8-9, 2000, a DSR occupational safety and health specialist met with local police department personnel and the pool director. During the course of the investigation, photographs of the incident site were taken and the police report was reviewed. The official cause of death was obtained in a telephone interview with personnel in the medical examiner's office.

The outdoor pool where the incident occurred, was part of a large recreational facility owned and operated by the community (see Figure 1). The pool director estimated that the staff for the community recreational facility included 6 full-time year-round staff and 80 part-time staff. There were 12-15 lifeguards on the pool staff each year. This year's staff of lifeguards included five 17-year-olds and one 16-year-old. Training was provided by the pool engineer who had worked for the recreational facility for 40 years. Training included safe methods to climb ladders, recognition and avoidance of heat stroke, life guard refresher training and testing, annual adult and infant cardiopulmonary resuscitation (CPR), first aid (every 3 years), safe handling of chlorine, and safe handling of chlorine tanks. A training day for all lifeguards was held each year the day before the pool opened and periodic training was given several times over the summer. The victim had worked at the community pool the summer prior to the incident as a lifeguard but had never performed seasonal pool maintenance. The incident occurred on the victim's first day of seasonal work and at that point no training had been given. Training for the season was scheduled to begin after seasonal work was completed when the full lifeguard staff was available. The pool had been in service since 1953 and there had never been a serious injury at the pool.

INVESTIGATION

The incident occurred at an outdoor community pool on May 27, 2000, during seasonal pool maintenance. For several weeks prior to the incident, lifeguards and city employees had been working at the pool getting it ready for the summer swimming season. In accordance with pool policy, the pool had been drained at the end of the previous swimming season and the diving board removed from its rack and placed in storage. On the day prior to the incident, five workers had taken the 500-pound wood and fiberglass diving board from storage and had placed it on its rack, located at the

north (deep) end of the empty pool. The diving board was placed to the rear of its mounting position with the bolt holes exposed as a visual reminder that it had not been bolted down, and was to be bolted in place the following day. No one was able to provide information as to why the board had not been secured at the time it was placed on its rack.

At 10 a.m. on the day of the incident, the victim's first day of work for the summer, the pool engineer and three other lifeguards arrived at the pool to complete maintenance activities prior to filling the pool with water. A small amount of water was allowed to flow into the pool so that the victim and another lifeguard could finish cleaning debris from the bottom of the pool. They were working from the pool floor, the victim in the deep end and the coworker in the shallow end, using mops to scrub the floor and sweep water toward the grate-covered drain located in the deep end of the pool. They were not in view of each other due to the configuration of the L-shaped pool. At 10:25 a.m., the pool engineer and one of the lifeguards went into the filter room to adjust the water valves while one of the lifeguards (victim's coworker) worked in the northeast corner of the pool at the 5-foot depth (see Figure 2). The crew were not available for interview, but the pool director reported that the coworker had informed him that he had last seen the victim working in the pool near the deep end, but that he had not seen the victim for several minutes prior to the incident.

According to the police report, the victim's coworker was working in the shallow end of the pool when he heard a "thump." He looked up and observed the diving board falling into the deep end of the pool, ran around the corner and saw the victim lying in the pool, with the diving board 12 to 18 inches from her body. The coworker told police he did not think the board had struck the victim and the police found no evidence, such as blood or hair, on the board that would have indicated that the board had struck the victim. The victim was lying face down in approximately 2 inches of water over the pool grate when the coworker reached her. The coworker moved the board, turned the victim faceup to prevent her from drowning, moved her out of the water toward the west end of the pool where the pool was less steeply sloped, and called for help. The pool engineer and the lifeguard heard the call for help from the filter room where they were working. They immediately called 911, then went to help the victim. Police and fire department personnel responded within 2 minutes and, finding the victim unresponsive and suffering from severe head trauma, immediately called for an ambulance. While emergency personnel treated the victim, police and pool employees developed a method for removing the victim. The pool slopes down to the grate-covered drain area and was wet and slippery, so they secured the victim to a backboard, attached ropes to the backboard, pulled her out of the pool and carried her to a waiting ambulance. The victim was placed in the ambulance at 10:49 a.m. and arrived at the local hospital at 10:55 a.m. She was flown to a regional trauma center where she was pronounced dead at 3:45 p.m. 3 days after the incident.

The coroner determined from the victim's injuries that she had died as a result of a fall. Although the incident was unwitnessed, evidence collected during the course of the FACE investigation suggests that the victim climbed out of the pool to the deck and then onto the unsecured diving board. As she walked out toward the end of the diving board, she lost her balance and fell into the nearly empty swimming pool. The diving board then fell into the pool. The fall distance for a standing position on the diving board to the grate-covered drain at the bottom of the pool is approximately 14 feet.

CAUSE OF DEATH

The Medical Examiner listed the cause of death as blunt force trauma to the head due to a fall.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should complete a hazard assessment that identifies hazards present during seasonal pool maintenance, and then develop, implement, and enforce standard operating procedures (SOPs) that, when followed, eliminate hazards or minimize worker exposure to risk of injury.

Discussion: When the pool is empty, a fall hazard exists for workers who work on the pool deck, from diving boards, or from ladders attached to the sides of the pool.

The potential fall distance from the pool deck to the pool floor in this incident was 5 feet at the shallow end, increasing to 11½ feet at the deep end. The distance from the diving board to the pool floor was approximately 14 feet. The potential fall distances from attached ladders ranged from 1 to 11 feet. Minimizing the fall hazard requires the development, implementation, and enforcement of standard operating procedures (SOPs) designed to protect workers while performing seasonal pool maintenance. The SOPs should clearly state that no one is allowed anywhere near the edge of the pool deck while performing maintenance, including cleaning, when the pool is empty. The access point to the pool should be limited to the shallow end. That access point should be clearly marked as the access point for maintenance, such as pool cleaning, painting, etc. The SOPs should also require that the pool is cleaned from the pool floor only. Once the inside of the pool is cleaned, the pool should be completely filled before workers are allowed on the deck areas to perform other cleaning activities or to place and secure the diving board. SOPs should clearly state that diving boards are to be moved into position on their racks or removed from their racks only when the pool is full. Working near an unsecured diving board over an empty pool exposes workers to both a fall hazard and to the hazard of being struck by the board should it slip from its rack. Employers can eliminate the hazard created by an unsecured diving board, by establishing and enforcing SOPs that require that diving boards be secured immediately after they are set in place for the season and removed immediately after they are unsecured at the end of the season. Pools should be filled before workers are allowed to work on the deck before the beginning of the swimming season and drained after all work has been completed on the pool deck at the end of the swimming season.

SOPs should require that warning signs be placed around the pool prior to emptying it each season, indicating that an empty pool creates a fall hazard. The sign should alert workers that the only allowed access to the empty pool is via the shallow end of the pool.

Recommendations 2: Employers should train all workers to recognize the hazards identified in the hazard assessment and train them to follow standard operating procedures (SOPs) designed to minimize their risks.

Discussion: Extensive training was provided to lifeguards to help them safeguard themselves and the public while performing life-guarding duties when the pool was open to the public. However, there

was no training provided to alert both lifeguards and other workers of the hazards present during seasonal maintenance activities. Training in recognizing hazards and training in standard operating procedures (SOPs) to be followed while performing pool maintenance activities should be given to all workers. Employers should make continual assessments to determine if their workers are competent in the recognition of hazards and that they adhere to SOPs and safe work practices.

INVESTIGATOR INFORMATION

This investigation was conducted by Deloris N. Higgins, Occupational Safety and Health Specialist, NIOSH Division of Safety Research, Surveillance and Field Investigation Branch, Fatality Assessment and Control Evaluation Team.

Figure 1. *Photographs of the Community Pool Where Incident Occurred.* The pool was made of stainless steel, was L-shaped, and had a chain link fence completely surrounding it. The photographs shown were taken several days following the incident, after the pool had been filled. The top photograph shows a distant view of the pool. The bottom photograph shows a closer view of the pool and shows the placement of the diving board after it had been secured in place after the incident.

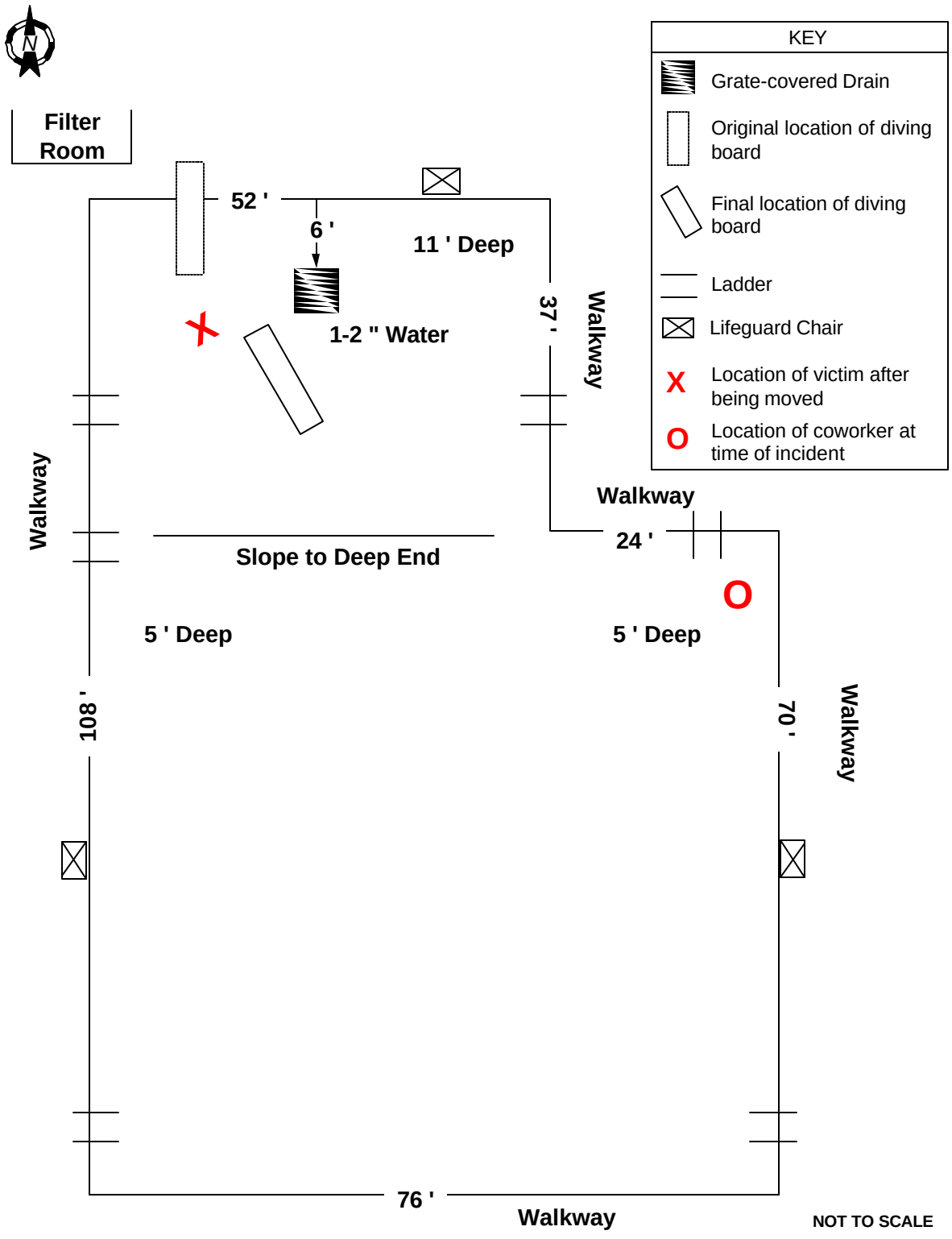

Figure 2. *Drawing of Community Swimming Pool Where Incident Occurred*

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