



SUBJECT: A bowling facility worker died when he was caught in a pinsetter machine.

SUMMARY

A 17-year old bowling facility worker died from injuries received on October 13, 2001, when he was caught in a pinsetter machine. Although he was employed by the bowling facility, he was not working at the time of the incident, but was bowling with friends. Oklahoma Fatality Assessment and Control Evaluation (OKFACE) investigators concluded that to prevent similar occurrences among employees who are working or recreationally bowling, employers should:

- Ensure adequate protection of workers from the hazards associated with moving machinery by the installation of guards and guarding devices.
- Ensure that unauthorized persons do not have access to the machine room.
- Establish an adequate safety training program, including written policies and procedures and performance review.
- Ensure that warning signs are posted in hazardous areas so as to adequately communicate the hazards to employees.
- Develop and implement a hazardous energy control (lockout) program.

INTRODUCTION

A 17-year old bowling facility worker died from injuries received on October 13, 2001 when he was caught in a pinsetter machine. At the time of the incident, the decedent had been employed at the bowling recreation facility for three weeks. Although he had some experience as an automotive mechanic, he had no prior experience at a recreational bowling facility. He normally worked approximately twenty-five hours per week, and his responsibilities included clearing jammed machines, ball return, janitorial services, and light machine maintenance. OKFACE investigators reviewed the death certificate, the Medical Examiner's report, internal company reports and witness statements, the pinsetter maintenance manual, general manufacturer technical data, the local police investigation report, and newspaper articles on the incident. While conducting the survey, OKFACE investigators interviewed the business owner and a representative of the local police department.

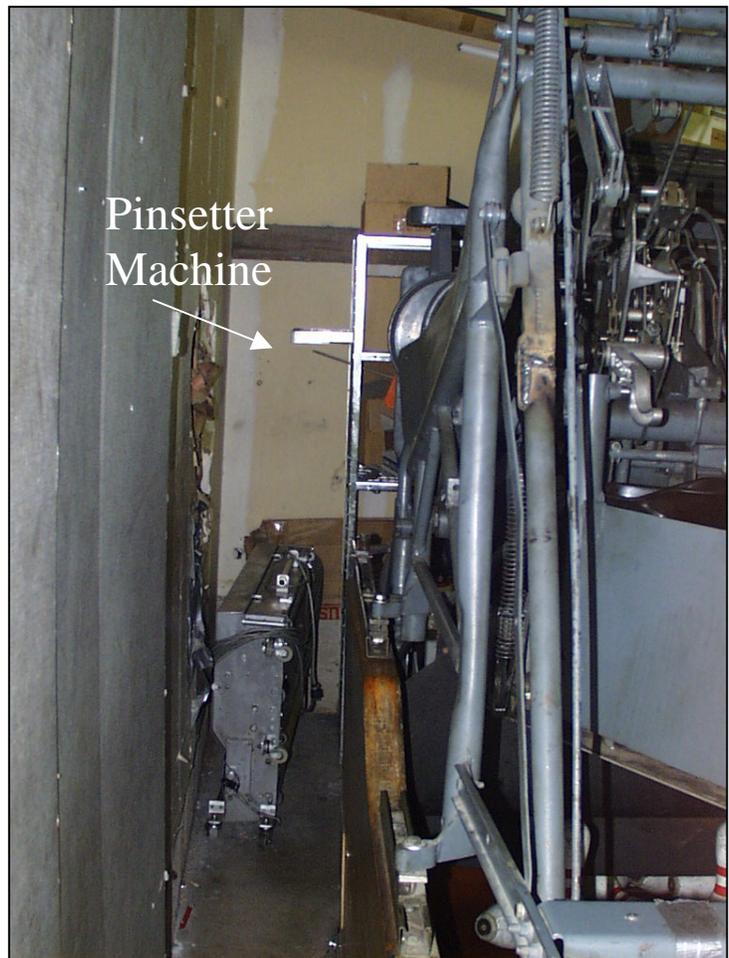


Figure 1. Walkway between pinsetter machine and wall

The facility had been open for approximately fourteen years with the last four under the current owner. The owner had managed the facility for six years prior to purchasing the business. OKFACE investigators found no objective evidence that the facility had a formal safety program or written safety policies, procedures or work practices. In their first week of employment, all new employees received training from the facility owner that reportedly addressed workplace hazards, but no written materials were available for any formal safety training. After the initial orientation, the owner directly supervised the employees until he believed they could safely perform their work. The owner reportedly instructed the employees to turn off the pinsetter machine before going near it, and he had implemented an informal lockout program. The owner performed all heavy maintenance and repair work on the pinsetting machines.

The employee received his fatal injuries from an automatic pinsetter that was approximately forty to forty-five years old. Other than the addition of electronic scorekeeping equipment, the machine had not been modified from its original manufactured design. Neither the current or former owners maintained detailed equipment maintenance records. The owner posted a regular maintenance schedule, including daily, weekly, monthly and annual maintenance procedures, on the wall for reference by employees.

The 17-year old deceased worker was determined to be bowling for recreation with his friends and was not on work duty at the time of the incident; however, his access to the machine that inflicted the fatal injuries was facilitated by his employment at the facility. The facility employed a total of six persons, three of whom were under eighteen years of age and one of whom performed the same type of work duties as the deceased worker. Two employees, one of whom was under eighteen years of age, were on duty at the facility when the fatal incident occurred.

INVESTIGATION

The employee arrived at the facility late in the evening on Saturday, October 13, 2001, to engage in recreational bowling with some friends. He was not scheduled to work that evening and had no work duties to perform while he was in the facility. After bowling for a short time on the southernmost lane next to the walkway to the machine room, which is behind the lanes, the employee's friends moved a few feet from the bowling area to play billiards while the employee continued to bowl alone. The worker threw a bowling ball then left the bowling area, proceeded down the narrow walkway, and entered the pinsetter machine room at the back of the bowling lanes.

Since a curtain covered the opening that separated the public area of the facility from the machine room, no one witnessed the worker's activities that immediately preceded the incident; however, the physical evidence at the scene suggested that the worker stood in the walkway between the pinsetter machine and the wall, reached

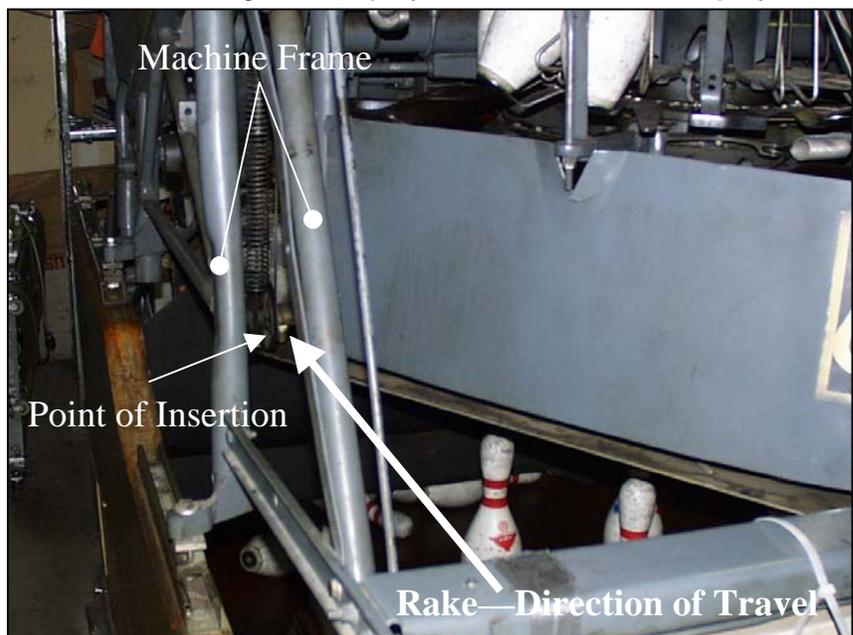


Figure 2. Area where victim leaned into the pinsetter machine



through an opening in the frame of the machine to pick up a pin, and in doing so inserted his torso within the frame of the machine (Figure 1 and 2). He then tossed the pin toward the back of the machine where it struck the pincushion, thereby causing the machine to automatically cycle. The rake lowered from its resting position and then swept backward toward the rear of the machine, performing its normal operative function by sweeping the bowling pins to the back of the machine to be automatically sorted and framed. The arm of the rake caught the worker, crushing his head against the machine's frame when it struck him. The incident occurred at approximately 10:30 pm.

Within a few moments, the worker's friends realized he had not returned from the machine room and one of the employees went back to see what had happened. He saw the employee's legs and disconnected the power to the pinsetter. An immediate call was placed to 911. An off-duty EMS technician was at the facility when the incident occurred, and the fire department, which was located in close proximity to the facility, arrived at the site very quickly. The victim was taken to the local hospital then transported by a medical flight to a trauma care center. The worker was pronounced brain-dead five days after the incident occurred.

CAUSE OF DEATH

The Medical Examiner listed the probable cause of death as head trauma.

RECOMMENDATIONS

Recommendation #1: Employers should ensure adequate protection of workers from the hazards associated with moving machinery by the installation of guards and guarding devices.

Discussion: The employee's position within the hazard area while the pinsetter machine automatically cycled was the underlying cause of the fatal incident. The area within the machine wherein moving parts create a serious hazard was readily accessible to employees. OSHA regulations require employers to provide "one or more methods of machine guarding to protect operators and other employees in the machine area from hazards such as those created by point of operation." Whereas adequate barrier protection may be difficult to achieve with this type of machinery, the employer could install electronic sensing devices or "light curtains" which would automatically shut off the pinsetter machine if any part of an employee's body is placed within the hazard area while the machine is operating. Employers should retrofit all machinery of this type to include either a barrier guard, a guarding device or some combination of these protective measures.

Recommendation #2: Employers should ensure that unauthorized persons do not have access to the machine room.

Discussion: Although the victim was not working at the time of the incident, he had access to the pinsetter machine room. Employers of bowling facilities should ensure that persons who are not working at the bowling facility and employees who are not properly trained to work on the machinery do not have access to the machine room. A locked door could restrict access only to authorized personnel who have a key. This incident might have been prevented if a locked door restricted the victim's access to the machine room.

Recommendation #3: Employers should establish an adequate safety training program, including written policies and procedures and performance review.

Discussion: The employer reportedly had an informal training program in place; however, there was not a formal written safety program. At the time of the incident, the employee was in a hazardous area within the frame of the pinsetter machine. There was an unwritten policy against



this practice on which the employee had reportedly been trained. The employer did not maintain records of the training; therefore, OKFACE investigators could identify any objective evidence on the training or its content. The effectiveness of training in the prevention of workplace incidents is directly dependent on the quality of the training. Employers should design and implement safety and health training programs in accordance with the severity of the hazards to which the worker is exposed and the extent to which employee performance is required for success of the necessary hazard controls. Once the training has been performed, evaluation of the training's effectiveness is a critical step in the success of the safety training program, and re-training should be implemented where performance is determined to be unsatisfactory.

Recommendation #4: Employers should ensure that warning signs are posted in hazardous areas so as to adequately communicate the hazards to employees.

Discussion: There were no signs posted on or around the machinery that communicated to all employees the hazards posed by the operation of the pinsetter and the movement of its component parts. OSHA regulations require the posting of warning signs to inform workers of hazards that are present in the work area.

Recommendation #5: Employers should develop and implement a hazardous energy control (lockout) program.

Discussion: The employer reportedly had developed certain informal energy control procedures that he verbally communicated to employees; however, OKFACE investigators identified no objective evidence that the employer had developed and implemented a written hazardous energy control program that met regulatory requirements. OSHA regulations require the development and implementation of a written program wherever employees may be exposed to the hazards of unexpected or unintended energization of machinery, and employers must develop procedures that address all potential energy sources whenever employees may be exposed to the hazards of moving machinery.

REFERENCES

1. Title 29 Code of Federal Regulations, Part 1910 (*Occupational Safety and Health Standards*), Sections 145, 147 and 212.
2. OSHAS 18001, *Occupational Safety & Health Assessment Series, Occupational safety and health management systems.*

The Oklahoma Fatality Assessment and Control Evaluation (OKFACE) is an occupational fatality surveillance project to determine the epidemiology of all fatal work-related injuries and identify and recommend prevention strategies. FACE is a research program of the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research.

These fatality investigations serve to prevent fatal work-related 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 injury, and the role of management in controlling how these factors interact.

For more information on fatal work-related injuries, please contact:

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