



SUBJECT: A yard hand was killed when he was crushed between the mast and the rollover protective structure of a forklift.

SUMMARY

A 72-year-old construction yard hand died on June 9, 2004 from chest trauma he received after being crushed between the mast and the rollover protective structure (ROPS) of the forklift he was operating. The victim was assigned to redistribute lumber that had been loaded on a 40-foot flatbed trailer at the company's storage yard facility. With a load of lumber elevated, he stepped out of the running lines and onto the front fender of the forklift to reposition the blocks used to separate the loads. The victim attempted to cross from the left fender to the right fender and, in the process of climbing across the front of the operator's station, unintentionally engaged the tilt control lever of the forklift with his foot. The mast tilted back and crushed the decedent. Two co-workers responded immediately and lowered the victim to the ground. He was transported to a local hospital and was pronounced dead in the emergency room.

Oklahoma Fatality Assessment and Control Evaluation (OKFACE) investigators concluded that to help prevent similar occurrences, employers should:

- Ensure that all forklift operators have received formal documented training, including hands-on training and an evaluation, and are competent to operate a forklift.
- Ensure that forklift operators do not position themselves between the uprights of the mast, outside the running lines of the truck, or under elevated forks or loads.
- Develop, implement, and enforce a comprehensive safety and health program that includes safe operating procedures for forklifts and compliance monitoring.

INTRODUCTION

A construction yard hand died on June 9, 2004 from chest trauma received when he was crushed between the mast and the rollover protective structure (ROPS) of the forklift he was operating. OKFACE investigators were notified of the incident, and an interview with company officials was conducted on July 26, 2004. OKFACE investigators also reviewed the death certificate and reports from the Medical Examiner, the sheriff's office, and the Occupational Safety and Health Administration (OSHA).



Figure 1. Forklift involved in the incident



Employer: The victim was employed by a highway and general construction contracting company. The company had been in business for 45 years and employed approximately 185 full-time workers. The company had owned the storage yard facility, where the incident occurred, for 25 years. The company had an active comprehensive written safety and health program, which included a labor/management safety committee and a management safety and health committee. There were written task-specific safe work procedures and machine-specific safe operating instructions for all tasks and equipment. Documentation of all training, safety meetings, and required certifications were kept on file and maintained by the company.

Victim: The 72-year-old male victim had 16 years of experience working in the construction yard and was employed by the same company for all 16 years. Seven years earlier, the victim had retired, but was hired again on a part-time basis two months later. At the time of the incident, he was operating a forklift for which he had many years of experience using. The decedent routinely operated a forklift as part of his assigned work duties, but had never been trained by the employer or received the certification required to operate the equipment.

Training: Tailgate-style safety meetings were conducted weekly at the job site by the field supervisor. Full-day supervisors' safety meetings were held semi-annually, and a management safety workshop was conducted annually. Machine-specific training utilized equipment manuals, hands-on experience, and on-the-job mentoring to meet the company's "experienced operator" certification. The effectiveness of the operator training was measured by a combination of testing and demonstration. A knowledgeable and experienced certified forklift instructor conducted the forklift training. The company believed each of their machine operators had met all regulatory licensing requirements.

Incident Scene: The employer used the incident site to store, load, and unload construction materials. The yard surface was composed of a gravel/chat/soil type mix. A company 40-foot flatbed trailer had been loaded with lumber, and the victim was assigned to redistribute the load. There were three employees, including the decedent, at the site when the incident occurred—a truck driver and two part-time yard hands. The victim was using a 6,000-pound lift capacity, rough terrain forklift that had been owned by the company for five years (Figure 1). The incident occurred early in the workday around 7:45 a.m.

Weather: On the day of the incident, the weather conditions were warm, but wet and rainy. The yard surface, flatbed trailer, and forklift all were wet from the rainy conditions.

INVESTIGATION

On the day of the incident, the victim and two co-workers were preparing a load of materials to be shipped to a job site from the company's storage yard. The decedent was operating a rough terrain forklift and lifting bundles of wood, so that spacing blocks (used to leave spaces between loads for inserting forklift forks) could be rearranged. The forklift was in good condition, properly functioning with all machine guarding in place. Since he had operated forklifts for years while working with the company, it was assumed that he had been trained and was certified to operate the equipment. However, it was later determined by company officials that the decedent had not attended any required forklift training classes and had not been evaluated in the work environment on that type of forklift. The other yard hand had not been trained either, yet also routinely operated a forklift to perform work duties. Their direct

supervisor had received the training the previous year, but was not onsite the day of the incident.

In an attempt to move one bundle of wood forward to even the weight, the victim raised the bundle in the air, well above the height of the trailer and its load. The forklift was only a few inches from the edge of the trailer at this time (Figure 2). Leaving the engine running, the decedent stepped out onto the front left fender of the forklift and reached across to remove four spacers. His body was positioned between the forklift mast and the



Figure 2. Forklift's position prior to incident.

top edge of the ROPS. Unable to reach the blocks from the forklift fender, he stepped across to the edge of the trailer with one foot and was able to remove three of the four. He then attempted to move across the front edge of the operator's compartment to the right fender. As he did, his foot engaged the tilt control lever and the mast began to move back, as the forklift was still running. The decedent had no time to react and was crushed. The decedent was wearing regular work boots, but the wet conditions may have contributed to his foot hitting the lever. In the operator's compartment was a caution label with the operating requirements to be performed prior to leaving the operator's seat: "Before leaving operator's seat; lower working units to the ground, place transmission gear selector lever in neutral, place reverser lever in neutral, engage parking brake, and stop engine." It was determined that both yard hands routinely used the forklift fenders to reach loads on the trailers.

The second yard hand, who was approximately 50 feet away, had looked away briefly and did not witness the incident. When he looked back and saw the decedent, he ran to the forklift and tilted the mast forward. With assistance from the truck driver (who did not witness the incident either), the second yard hand lowered the victim to the ground and immediately called for emergency help. The victim was transported by ambulance to a local hospital where he was pronounced dead in the emergency room.

CAUSE OF DEATH

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

RECOMMENDATIONS

Recommendation #1: Employers should ensure that all forklift operators have received formal documented training, including hands-on training and an evaluation, and are competent to operate a forklift.

Discussion: According to the OSHA regulations for powered industrial trucks, operators must be competent in the safe operation of their equipment prior to use, which includes successful completion of training and evaluation. The training should include formal instruction,



consisting of required program content, practical hands-on training, and an evaluation. The trainee must be evaluated in the workplace on the type(s) of vehicle(s) necessary for performing assigned job duties. Training must be conducted by knowledgeable and experienced instructors who have the training to evaluate the competence and performance of others. Training should be conducted in a language the trainee understands, and written material should be at an appropriate literacy level. Refresher training should be performed in the event of particular circumstances (e.g., different truck assignment, observed operating in an unsafe manner, involvement in a near-miss incident, etc.) or once every three years. Thorough documentation of all training should be kept on file with the company. Operators should have the skills to assess the hazards associated with a work environment and the equipment being used, including weather conditions, and know how to control them. Had the yard hands been formally trained, they may have had the knowledge to safely operate the forklift and prevent the incident from occurring.

Recommendation #2: Employers should ensure that forklift operators do not position themselves between the uprights of the mast, outside the running lines of the truck, or work under elevated forks or loads.

Discussion: The OSHA standards for powered industrial trucks also indicate that authorized operators shall not place arms or legs outside the running lines of the truck or between the uprights of the mast. Furthermore, no one should pass or work under elevated portions of the truck under any circumstances, unless the forks have been chained and locked out to an overhead hoist, crane, or beam capable of supporting the weight. When the truck is running, the operator must remain inside the operator's compartment; power should be shut off when leaving a powered industrial truck unattended. Proper instruction and supervision of employees will give workers the knowledge of these and other safe operating procedures to prevent misuse of equipment.

Recommendation #3: Employers should develop, implement, and enforce a comprehensive safety and health program that includes safe operating procedures for forklifts and compliance monitoring.

Discussion: Employers should develop comprehensive, written safety programs that incorporate guidelines for safely operating forklifts and other powered trucks, as specified by OSHA regulations. Employees should be provided copies of the written program and the material should be in the language and literacy level of the workers. The program should include the policies regarding forklift training, retraining, and certification. Safe operating procedures and hazard recognition and control should also be detailed. Employee compliance with all policies and procedures should be monitored by employers and refresher training conducted as warranted.

REFERENCES

- Occupational Safety and Health Administration. *Occupational Safety and Health Standards: Powered Industrial Truck Standard*. 29 CFR 1910.178.
- National Institute for Occupational Safety and Health. *NIOSH ALERT: Preventing Injuries and Deaths of Workers Who Operate or Work Near Forklifts*. Department of Health and Human Services, Publication No. 2001-109, June 2001.



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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.

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