NIOSH

FACE

Fatality Assessment and Control Evaluation Program

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Hispanic Construction Laborer Dies and Two Coworkers Are Injured After Falling 10 Feet From an Unsecured Box on the Forks of a Forklift - North Carolina

SUMMARY

On August 26, 2002, a 23-year-old Hispanic construction laborer (the victim) died and two coworkers were injured after falling 10 feet to the ground from an unsecured wooden box that had been elevated on the forks of a rough terrain forklift (Photo1). After the victim and his coworkers had been lifted in the box (Photo2) to a position where they could wash a recently bricked wall, the forklift operator, who was also the victim's foreman, exited the forklift. Several minutes later the forklift operator and a coworker heard workers screaming and heard a scraping sound as the box and workers struck the ground. The forklift operator ran to help the workers who had fallen while the coworker called 911. The forklift operator performed cardiopulmonary resuscitation (CPR) on the victim who had no pulse and was not breathing. Emergency Medical Services (EMS) and police personnel responded within 5 minutes. EMS personnel continued CPR on the victim and provided first aid to the injured workers before transporting all three workers to the local hospital. The victim was pronounced dead in the hospital emergency room. One injured coworker was hospitalized and the other was treated for his injuries and released the following day.

Photo 1. This photo illustrates the forklift used on the day of the incident to lift personnel. Photograph courtesy of the County Sheriff's Office.

Fatality Assessment and Control Evaluation (FACE) Program

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, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin. The goal of FACE is to prevent fatal work injuries 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. FACE investigators evaluate information from multiple sources that may include: interviews of employers, workers, and other investigators; examination and measurement of the fatality site, and related equipment; and review of records such as OSHA, police, medical examiner reports, and employer safety procedures and training records. The FACE program does not seek to determine fault or place blame on companies or individual workers. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future. For further information visit the FACE website at www.cdc.gov/niosh/face/faceweb.html or call toll free 1-800-35-NIOSH.

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

- ***implement a policy which requires the use of a safety platform secured to the lifting carriage and/or forks when lifting personnel with a powered industrial truck (e.g., forklift)***

- ***develop, implement, and enforce a comprehensive written safety program for all workers which includes training in hazard recognition and the avoidance of unsafe conditions. The comprehensive training plan should identify required specialized training, i.e., fall protection training and training for forklift operators***

- ***ensure that workers who are part of a multilingual workforce comprehend instructions in safe work procedures for the tasks to which they are assigned***

Additionally,

- ***general contractors should ensure through contract language that all subcontractors implement appropriate safety and health programs and training specific to the work performed.***

Photo 2. This photo illustrates the wooden box used on the day of the incident to lift personnel. The box was moved before the photograph was taken. Photograph courtesy of the County Sheriff's Office.

INTRODUCTION

On August 26, 2002, a 23-year-old Hispanic construction laborer (the victim) died and two coworkers were injured after falling 10 feet to the ground from inside an unsecured wooden box elevated on the forks of a rough terrain forklift. In September 2002, officials of the North Carolina Occupational Safety and Health Administration (NC OSHA) notified the National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), of the incident. On December 2, 2002, a DSR safety and occupational heath specialist conducted an investigation of the incident and reviewed incident circumstances with the NC OSHA compliance officer assigned to the case. Photographs of the incident site, the forklift, and the wooden box taken by NC OSHA shortly after the incident were reviewed. No site visit was conducted as the project had been completed and the forklift and wooden box had been removed. The company office manager, who was assigned safety management duties following the incident, was interviewed by telephone. The medical examiner's and sheriff's reports were reviewed. The official cause of death was obtained from the medical examiner's report.

The victim's employer was a roofing, framing, and masonry subcontractor that had been in business for 17 years. The company employed 49 full-time employees. Two masonry crews had been working at the incident site for 2 months placing and washing brick on the exterior walls of five recently completed buildings. The work shift started at 6:30 a.m. and ended at approximately 4:30 p.m daily.

The victim had moved from Mexico to the United States and had been working for the company as a laborer for 2 months before the incident. The victim's primary language was Spanish. One of the injured coworker's primary language was Spanish. The other injured coworker's primary language was English. The foreman who lifted the workers with the forklift spoke both English and Spanish.

The company had no written comprehensive safety program. On-the-job training was provided on an as-needed basis by foremen and focused on training workers to complete job tasks. The company office manager reported that the forklift operator involved in the incident had indicated past forklift operator training at the time he was hired, but this training was not documented or evaluated by the company. The victim had no training beyond on-the-job task training. This was the company's first workplace fatality.

INVESTIGATION

The site of the incident was an apartment complex where five two-story townhouses had been recently constructed. According to the office manager, the company had been subcontracted to perform masonry work on the apartments and had been working at the site for 2 months before the incident. They planned to complete the job in another month. The two crews assigned to the site were composed of two foremen, six masons and seven laborers. They arrived on site at approximately 6:30 a.m. on the day of the incident to perform brick work. It began raining and the two foremen decided to call off work for the day but, before doing so, decided to have workers wash bricks on a recently bricked exterior wall of an apartment building. One foreman asked the other foreman to get a forklift that belonged to the general contractor and pick up a box and drive the forklift and box over to the area near the apartment that was to be washed. The ground in the area where the forklift was to travel and the area where it was to be used was fairly level. Workers were to be elevated to a position next to the recently bricked apartment wall where they were to clean the bricks by using hand brushes dipped into pails of muriatic acid and then spraying the bricks with water.

After the foreman drove the forklift over to his area, the foreman who had requested the forklift got on the forklift and lifted the unsecured wooden box with three men inside approximately 10 to 12 feet in the air to a location where they could wash and spray rinse the brick. Each worker was equipped with a pail of muriatic acid and a hand brush. A length of hose was coiled in the bottom of the wooden box and was connected to a water source below. Workers were to use the hose to spray the wall after washing it with muriatic acid. After he had elevated the workers, the foreman exited the forklift with its engine running and walked away to perform another task. There is no information available to determine whether the forklift's parking brake had been set before the foreman exited. Minutes later, the foreman who had elevated the workers heard workers' screams and a scraping sound as the box fell. Both foremen had been completing other tasks at the time and had their backs to the forklift and had not seen the box and workers fall. The incident occurred approximately 2 minutes after the lift at approximately 7:30 a.m. The foreman who had elevated the workers ran to help the injured workers while the other foreman called 911. One worker was lying away from the box and two were lying under the box. One edge of the box was lying on the victim's leg and a coworker was lying on top of the victim. The forklift operator performed cardiopulmonary resuscitation (CPR) on the victim, who had no pulse and was not breathing. Emergency Medical Services (EMS) and police personnel responded within 5 minutes. EMS personnel continued CPR on the victim and provided first aid to the injured workers before transporting all three workers to the local hospital. The victim was pronounced dead in the hospital emergency room. One injured coworker was hospitalized and the other was treated for his injuries and released the following day.

Sheriff's office personnel interviewed the injured workers the day following the incident. The worker who had fallen clear of the box reported that he and two Mexican workers were washing some brick when all of a sudden the box flipped and threw him to the ground. The other worker, speaking through an interpreter, reported that he and the victim and a white male were washing some bricks on an apartment wall when all of a sudden the box flipped toward the left. He stated that he was standing on the right, the victim on the left, and the white male was in the middle. He stated that he fell on top of the victim.

The forklift used in the incident had been rented by the general contractor from an equipment rental company and, according to the sheriff's report, the forklift operator had seen the forklift with the wooden box used by other subcontractors to lift personnel and therefore thought it was safe to use. According to the company office manager, the subcontractor owned two forklifts with safety platforms attached, but one of these was in a repair shop and the other was being used at another worksite. According to the NC OSHA report, the wooden box measured 4 feet deep by 4 feet wide by 10 feet long; the forklift was fully functional; and the forks on the forklift were spaced 36 inches apart. The forks on the forklift had the capacity to expand to 66 inches apart. When sheriff's personnel examined the underside of the box, they found no support to prevent the box from tilting on the forks of the forklift. The box had three sides and a floor and had sustained damage on the top left section where it had struck the ground.

The rental company inspected the high-reach telescoping rough terrain forklift that had been used during the incident and determined that it was functioning correctly. The lift capacity of the equipment was 5,000 pounds. According to the rental representative, the rental company does not rent a safety platform/lift carriage for this type of equipment because the equipment is designed for material handling only.

CAUSE OF DEATH

The medical examiner's report indicated that the cause of death was blunt-force injuries and chest compression.

RECOMMENDATIONS /DISCUSSION

Recommendation 1: Employers should implement a policy which requires the use of a safety platform secured to the lifting carriage and/or forks when lifting personnel with a powered industrial truck (e.g., forklift).

Discussion: In this incident, a wooden job-made trash box used as a work surface was elevated, unsecured, on the forks of a rough terrain forklift. According to OSHA, when using trucks equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the use of a safety platform secured to the lifting carriage and /or forks is required for the protection of personnel being lifted.[1]

A safety platform, which is referred to as a lifting cage, should be equipped with a proper guardrail system and a means for locking the gate. The lift cage must be safely secured to the mast of the lift truck. Forks on the lift truck must be opened as wide as possible. The person operating the lift truck must not leave the lift truck; this ensures that the person in the lift cage can give immediate instructions to the operator. A means should be provided to allow personnel on the platform to shut off power to the forklift.[2]

To further improve safety while working from an elevated safety platform, an independent restraining system should be used such as a full-body harness with an attached lanyard or deceleration device properly secured to a safe anchorage point on the mast of the forklift. This type of restraint should be used to prevent workers from falling should the safety platform fall from the forks. Employers can obtain additional information regarding forklift safety in NIOSH Alert 2001-109.[3]

Additionally, employers should consider going beyond minimum OSHA requirements and choose a safer method for positioning workers in elevated work areas. An aerial platform or a scaffold appropriate for the job and used correctly may provide a safer alternative for positioning workers to conduct brick washing work.

The Equipment Manufacturers Institute, a proprietary organization which produces many safety manuals for operators and mechanics, recommends in the Rough Terrain Forklift Safety Manual " that a rough terrain forklift is designed to lift and transport material and should not be used to elevate personnel. Only equipment designed specifically to elevate personnel should be used for this purpose."[4]

Recommendation 2: Employers should develop, implement, and enforce a comprehensive written safety program for all workers which includes training in hazard recognition and the avoidance of unsafe conditions. The comprehensive training plan should identify required specialized training, i.e., fall protection training and training for forklift operators.

Discussion: Employers should evaluate tasks performed by workers, identify all potential hazards, then develop, implement, and enforce a written safety program addressing these hazards. Additionally, according to 29 CFR 1926.21 (b)(2),[5] "the employer shall instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to their work environment to control or eliminate any hazards or other exposure to injury or illness." In this incident, the forklift operator who performed the lift, and the workers who were lifted in the box failed to recognize the fall hazard created when workers were elevated 10 feet without fall protection in an inappropriate and unsecured box used as a personnel lift. Safety training that included training specific to protection against fall hazards may have helped the victim and his coworkers recognize the hazard of working unrestrained in the unsecured box. OSHA requires that all employees exposed to fall hazards receive training specific to fall protection under 29CFR 1926.503 (a)(1). [6] Safety training should be reinforced by holding periodic safety meetings where safety issues are discussed and hazard controls reviewed. The content of the safety training provided and the names of employees that attended the training/safety meeting should be documented and kept for future reference.

Specialized forklift operator safety training should be provided for all forklift operators. Forklift operator training should be certified in writing and should identify by name each operator that has been trained, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation. This training in forklift operation should be given by a person who has the knowledge, training, and experience necessary to train operators and should consist of a combination of formal instruction (i.e., lecture, discussion, interactive computer learning, videotape written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and evaluation of operator performance in the workplace. Requirements for training forklift operators in construction are stipulated in Part 29 Code of Federal Regulations, 1926.602(d) by reference to 29 CFR 1910.178(1).[7]

Recommendation 3: Employers should ensure that workers who are part of a multilingual workforce comprehend instructions in safe work procedures for the tasks to which they are assigned.

Discussion: Companies that employ workers who do not understand English should identify the languages spoken by their employees and design, implement, and enforce a multilanguage safety program. To the extent feasible, the safety program should be developed at a literacy level that corresponds with the literacy level of the company workforce. Companies may need to consider providing special safety training for workers with low literacy to meet their safety responsibilities. The program, in addition to being multilanguage, should include a competent interpreter to explain worker rights to protection in the workplace, safe work practices workers are expected to adhere to, specific safety protection for all tasks performed, ways to identify and avoid hazards, and who they should contact when safety and health issues arise. Employers should also develop safety posters and signs in the appropriate languages and post them in conspicuous places.

Recommendation 4: General contractors should ensure through contract language that all subcontractors implement appropriate safety and health programs and training specific to the work performed.

Discussion: General contractors should use contract language that requires all subcontractors to identify how they intend to implement a site-specific safety and heath program before the initiation of work. Subcontractors' safety programs should contain clear and concise language as to which party is responsible for a given safety or health issue. Any differences should be negotiated before work begins. Once the provision for these responsibilities has been established, the respective parties should ensure that the provisions of the contract regarding safety and heath are upheld through regular inspections of the worksite.

General contractors should ensure that all subcontractors have training programs in place that address the tasks their workers are assigned to perform. Additionally, the contract should specifically address whether any equipment on site is to be shared between the parties, and if so, should state clearly worker training required before operating the equipment, safety procedures to be followed when using equipment, and equipment inspection responsibilities. When forklifts are used on site, the contract should clearly state that forklifts can only be operated by trained operators and that they are not to be used to lift personnel unless the forklift is rated to do so, a properly designed and secured safety platform is used, and workers are adequately restrained. Alternatively, the contract may indicate that forklifts are not to be used to lift personnel under any circumstances.

REFERENCES

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3. NIOSH [1999]. NIOSH Alert: preventing injuries and death of workers who operate or work near forklifts. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, DHHS (NIOSH) Publication No. 2001-109.

4. Equipment Manufacturers Institute. Rough terrain forklift. Chicago: Illinois. Form #RT85-2.

5. Code of Federal Regulations 2001 edition. 29 CFR 1926.21 (b)(2). Safety Training and Education. U.S. Printing Office, Office of the Federal Register, Washington, D.C.

6. Code of Federal Regulations 2001 edition. 29 CFR 1926.503(a)(1). Training Program. U.S. Printing Office, Office of the Federal Register, Washington, D.C.

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INVESTIGATOR INFORMATION

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