FACE INVESTIGATION: #04WI003

SUBJECT: Laborer Dies when Crushed Between Forklift Cage and Mast

SUMMARY

On January 21, 2004, a 41-year-old male laborer (the victim) died when he was crushed between the cage of a forklift and the forklift mast. The victim was using a Caterpillar forklift (powered industrial truck) to unload bundled lumber from a semi-truck in the warehouse of a cabinet manufacturing shop. He had unloaded three bundles of lumber and stacked them against a wall in the building. He was preparing to stack the fourth bundle on top of the third bundle and it is surmised that he noticed one of the spacers on the third bundle, upon which the fourth bundle would be placed, was missing. (Figure 1.) The victim apparently climbed to the top of the bundle on the forklift to the area where the spacer should have been, and slipped, falling into the forklift controls. This caused the mast to tilt backwards and pin him. He was alone at the time of the incident and was found pinned between the forklift cage and the mast by the semi-truck driver. The semi-truck driver summoned other employees in the warehouse. The victim was freed from the forklift and CPR was performed by two other employees, while a third employee notified the emergency medical services (EMS). EMS arrived within five minutes and continued CPR. They determined the victim had no signs of life and contacted the county coroner, who requested the victim be transported to a local hospital. EMS transported the victim in the ambulance to the hospital where he was pronounced dead. FACE investigators concluded that, to help prevent similar occurrences, employers should:

Figure 1. The forklift stacking the fourth bundle of lumber.

- **ensure that employees follow safety standards for properly dismounting a forklift.**
- **ensure that employees follow the safety standards for proper load manipulation, unloading and stacking.**
- **ensure that the forklift operator's retraining covers his assigned duties.**

INTRODUCTION

On January 21, 2004, a 41-year-old male laborer (the victim) died when he was crushed between the cage of a forklift and the forklift mast. The victim was using a forklift to unload bundled lumber from a semi-truck in the warehouse at a cabinet manufacturing shop. On January 27, 2004, the FACE investigators learned about the incident from the news media. In October 2004, FACE investigators sent a letter to the company and requested an interview. A week later, FACE investigators followed up with a telephone call to the company, who at that time declined an interview. FACE investigators reviewed official reports. The content of this report is based on the information from evidence presented in the official reports.

The privately owned company was established approximately 45 years ago by the current president and the vice president. In addition to the president and vice president, the company employs a safety director and approximately 200 workers. Three of the workers were forklift operators. The current manufacturing facility is approximately 160,000 square feet in size. A variety of custom-built furniture in addition to cabinets, doors, moldings and countertops, are produced by this company and are supplied to over 200 remodeling and home building contractors.

The victim had worked for the company for 15 years. At the time of the incident, he worked the second shift operating a forklift. He received his initial training in forklift operation from the forklift manufacturer 10 years before the incident. In addition to the initial certification, employees had to meet the annual requirement for on-site observation by a supervisor to ensure that the operator was operating in a proper and safe manner. The last on-site observation training for the victim was completed three months before the incident.

The victim's initial training for certification included a class session, the operator's checklist, a video, written test and a driving test. He received an information handout that included a section about unattended forklifts and proper dismounting. The written test and the annual on-site-observation-driving test did not cover the section about unattended forklifts or proper dismounting.

INVESTIGATION

The company purchased lumber that was delivered on a semi-truck to the warehouse where the incident occurred. The victim's job at the warehouse was to use the Caterpillar forklift and transport the bundled lumber from the semi-truck and stack it against the wall in the warehouse. Each bundle was placed on a 2" x 4" x 4' board that was stacked edgewise on the 2" edge to be used as a spacer between the bundles of lumber when they were stacked against the wall. (Figure 2) One of the 2" x 4" x 4' spacers was placed on the left end of the, while another was placed on the right end of the bundle of lumber. When the bundled lumber was taken from the semi-truck, the load was lowered to the ground and the two loose

Figure 2. The spacers are stacked edge-wise.

2” x 4”x 4’ spacers were placed on each end at the top of the bundled lumber. Following this procedure, the load was transported via forklift to the wall where the bundled lumber was stacked. The load was raised and the bundled lumber was placed in its final position against the wall. This method ensured the 2” x 4” x 4’ spacers were in place for the next bundle to be stacked on top of them.

On the evening of the incident, the victim unloaded three bundles of lumber and placed them against the wall in the warehouse. He was preparing to stack the fourth bundle on top of the three bundles that had been stacked. The 2” x 4” x 4’ spacers were in place on the first two bundles of lumber. The fourth and final bundle was raised and the 2” x 4” x 4’ spacer on the left side of the third bundle was in place. However, the 2” x 4” x 4’ spacer on the right side of the bundle was missing. It was found on the floor beside the stack of bundled lumber after the incident.

When the victim was found, the load with the fourth bundle on the forklift was raised and in place to be unloaded at a height of approximately 10 feet. Since no witnesses were present at the time of the incident, the following description of what occurred was constructed from the evidence. It is unknown if the spacer fell off the third bundle or if the victim knocked the spacer off the right side with the forklift when he brought the fourth bundle to the unloading area. The victim left the seat of the forklift. He did not lower the load on the forklift, nor did he use the lock knob to put the lock into place on the forklift. It appeared that he tried to climb up the forklift and the bundled lumber to place the right side 2” x 4” x 4’ spacer in the correct position on top of the third bundle. He slipped and fell back between the forklift mast and the front of the cage area of the forklift. His lower extremities came in contact with the control levers.

The forklift had four levers to operate the direction of the load. Starting from the left side of the four levers, the first lever on the left raised and lowered the mast. The second lever tilted the mast either away from or towards the forklift. The third lever allowed the operator to move the load a few inches to the right and the fourth lever allowed the operator to move the load a few inches to the left. (Figure 3) It is surmised that when the victim fell between the mast and the front of the cage area, he initiated the second lever which caused the mast to tilt back towards the cage, pinning him between the mast and the cage.

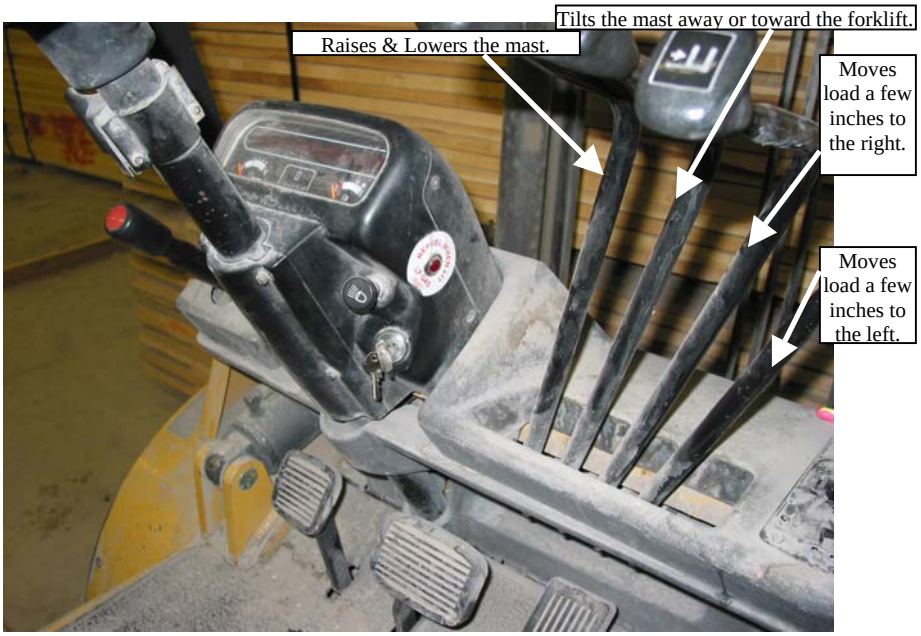

Figure 3. Forklift controls.

When the victim had two bundles of lumber left to unload, the semi-truck driver left the area. After about 10 minutes, the driver wondered why the victim had not brought the paperwork to him. At that time, the driver returned to his semi-truck and realized that the victim hadn't unloaded the remainder of the lumber. He went into the warehouse to find him. He found the victim pinned between the forklift cage and mast.

The semi-truck driver waved to three employees from the other end of the warehouse. Employee 1 contacted the emergency medical service (EMS), employee 2 ran to get the Supervisor and employee 3 operated the forklift, shifting the mast forward. He and the semi-truck driver freed the victim from the forklift and lowered him to the ground. The Supervisor and another employee, who is an emergency medical technician (EMT), started CPR. Within five minutes, EMS arrived and took over performing CPR. It was determined the victim had no signs of life and the coroner was summoned. EMS transported the victim to a local hospital where he was pronounced dead.

CAUSE OF DEATH

The official cause of death was compressional asphyxia due to entrapment in a forklift.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Ensure that employees follow safety standards for properly dismounting a forklift.
Discussion: OSHA standards for general industry 1910.178 state that when the operator of a forklift is dismounted and within 25 feet of the forklift still in his view, the load engaging means shall be fully lowered, controls neutralized and the brakes set to prevent movement. The Caterpillar Maintenance and Operator's Manual states the following when leaving the forklift or parking it:

- Set the parking brake.
- Put the direction lever in neutral.
- Place the lock knob in the lock position.
- Lower the forks fully to the floor. Tilt the mast forward until the forks are flat.
- Turn off the key.

Hands, feet and all body parts should be kept away from the mast, reach mechanism and other pinch points. Do not climb on any part of the forklift.

Recommendation #2: Ensure that employees follow safety standards for proper load manipulation, unloading and stacking.
Discussion: If there is a problem with unloading or stacking the load, the load should be lowered and a safe strategy to get the job completed must be identified. In this case, if the load had been lowered, the victim would not have been able to reach the top of the third stack of bundled lumber. Employers should ensure that equipment is available for gaining safe access to

elevated areas. Appropriate ladders, mobile scaffolds and/or lifts used in accordance with OSHA safety standards can be used for this purpose.

Recommendation #3: Ensure that the forklift operator's retraining covers his assigned duties.

Discussion: Competency is demonstrated by the successful completion of the training and evaluation specified by OSHA in 1910.178. In this case, the operator completed the certification training 10 years prior to the incident and received refresher training and evaluation. In the initial training, the topic of dismounting from a forklift was covered by a handout that was given to the trainees. The refresher training did not cover the rules for dismounting a forklift. While the victim completed the certification, he left the seat of the forklift and climbed on the forklift and bundled lumber in order to place the 2" x 4" x 4' spacers in the appropriate position on top of the third stack of bundled lumber.

REFERENCES

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WISCONSIN FATALITY ASSESSMENT AND CONTROL EVALUATION (FACE) PROGRAM

FACE INVESTIGATION # 04WI003

Staff members of the FACE Project of the Wisconsin Division of Public Health, Bureau of Environmental and Occupational Health, conduct FACE investigations when a machine-related, youth worker, Hispanic worker, highway work-zone death, farmers with disabilities or cultural and faith-based communities' work-related fatality is reported. The goal of these investigations is to prevent fatal work injuries studying: the working 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.

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