Operator Dies When Caught Between Mast and Cage of Forklift in a Massachusetts Warehouse

Investigation #: 98-MA-049-01
Release Date:

SUMMARY

On November 23, 1998, a 40 year old male forktruck operator died of injuries sustained when he was caught between the mast and the cage of his forklift truck. He was placing a load in a narrow row when the load became stuck. The forklift truck operator apparently placed the load on the floor, backed up the truck, tilted the mast forward and stood up between the mast and the cage in an attempt to see over the load. His foot somehow caught on the lever which controlled the mast causing the mast to tilt toward the cage crushing the victim. The victim was found by a co-worker who summoned for help.

The MA FACE Program concluded that to prevent similar future occurrences:

1. **Employers should examine plant layout to eliminate hazardous conditions.**

2. **Manufacturers of forklift trucks should consider the following safety improvements:**
   a) **the addition of a guard on the front of the operator's area; and,**
   b) **connecting the seat safety switch to the hydraulic load controls in such a way that the levers cannot be operated when the operator is not in the seat.**

3. **Employers should develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, a thorough hazard analysis and utilization of controls particular to the job.**

INTRODUCTION

On November 25, the MA FACE Program learned through a telephone call from OSHA that a 40 year old forklift truck operator had died two days earlier from injuries received in a forklift truck incident at a food warehouse. An investigation was immediately initiated. On December 4, the MA FACE Program Director and industrial hygienist traveled to the incident site where a review of the scene took place and where the plant manger and a corporate official were interviewed. The **police report**, death certificate, photographs and the vehicle operator's manual were obtained during the course of the investigation.

The company was a food production and distribution plant in business for approximately thirteen years at the current location. It employed approximately 300 workers regularly and up to 50 more on a seasonal basis. There was a designated safety person on the incident site, and there were written company safety policies and procedures in place on the day of the incident. Some of these policies and procedures addressed the hazards associated with this fatality.

The victim was forklift truck operator who had worked for the company for seven years at the time of his death. His background included training in forklift operation and other related work practices. Forklift training was conducted by a forklift truck company representative. There were eighteen forklift truck operators employed at the facility, mostly on two shifts. A third shift employed a few operators and the clean-up crew.

INVESTIGATION

On November 23, a food production and distribution company was performing its usual operations. A food product would be mixed and packaged into gallon jars in one part of the facility. Jars were placed into cardboard cases, which were then loaded onto pallets, which were moved by forklift trucks to the warehouse for storage or to a holding area for shipment. Forklift operators used the same forklift truck each day and were responsible for its daily inspection. They were required to fill out and sign an inspection checklist each day.

In the warehouse, the pallets were stored in rows slightly wider than the width of the pallets. Each pallet was approximately 40 inches wide by 48 inches deep and held 48 cases of product stacked 4 cases high. Pallets were stacked two high for an approximate height of 7 feet. Each row was 11 pallets deep, for a total length of about 44 feet. A typical forklift truck load was two pallets high. A forklift truck would move about 7000 cases per day which translates to approximately 72 trips per day or 9 trips per hour.

At the time of the incident, the forklift operator was moving a typical load of product into a new row. This row was between two other rows and therefore had little clearance on either side. The forklift truck had reached a point about 3 pallets from the end of the row when the load caught up on something and could go no further. The operator lowered the load to the floor and backed up the vehicle. He then apparently tilted the mast forward and stood up between the mast and the cage in an attempt to see over the load. As he was standing there, with his torso between the mast and the cage of the truck, his foot somehow caught on the lever which controlled the mast causing the mast to tilt toward the cage. Apparently he attempted to duck back down, but was unsuccessful, and his head was caught between the mast and the cage.

A co-worker who was looking for the victim, found him in this position and called for help. The victim was removed from the forklift by co-workers. Emergency medical services arrived and transported him by ambulance to a local hospital where he was determined to be dead on arrival.

The forklift truck involved in the incident was an electric-powered four wheel sitdown rider with a capacity of 4000 lbs. The top of the forklift is about 83 inches from the ground, which was about the same height as the load (84 inches). The driver, standing up in the driver's area of the forklift could not see over the load. The seat and dash are about 22 inches from the truck floor. Standing on this level would allow an operator to get his head and chest above the top of the truck. It was not possible to stand straight up due to the overhead guard, which is required to protect operators from falling objects. Therefore, to see over the load, the operator decided to climb up onto the seat and dash.

On the forklift truck, there are three levers to the right of the operator's seat. From inside to outside, the levers controlled 1) lifting the forks, 2) tilting the mast and 3) side-shifting the forks, which was a special attachment. The victim's foot had apparently pushed the lever toward the back of the vehicle. Pushing each of the three levers in the backward direction would 1) raise the forks, 2) tilt the mast rearward or 3) move the forks together. The investigation revealed that the forks were raised about 5 feet from the floor at the time of the incident. It is possible that the victim's foot had engaged both the lever for the mast and the lever for lifting the forks simultaneously. However, if the forks had been on the ground the mast could not tilt forward enough to allow the victim to climb between the mast and the cage. Therefore it is more likely that the victim had raised the forks somewhat in order to tilt the mast forward before climbing.

At the time of the incident, it was observed that the key remained in the ON position. The vehicle was equipped with a seat activated safety switch which disables the vehicle from movement when there is no weight on the seat. Some observers hypothesized that when the victim stood up from the seat all vehicle systems were disabled. When he then stepped on the seat while climbing, the load controls were re-energized. However, it is not clear from the manufacturer's manual that the load controls, the three levers, were ever disabled by the seat safety switch. When contacted, the manufacturer was unwilling to answer questions about the vehicle.

CAUSE OF DEATH

The medical examiner listed the cause of death as blunt head trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should examine plant layout to eliminate hazardous conditions.

Discussion: When carrying large loads that obstruct the vision of forklift operators, standard procedure is to operate in reverse. The operator then has an unobstructed view of where he is going. While placing loads in narrow rows, it is not possible to operate in reverse. Therefore, the operator's view is always obstructed during this operation. This creates a possibly hazardous condition, as it did in this incident.

One possible control in this situation could be to make the aisles slightly wider so that the pallets and/or boxes are less likely to interfere with the adjacent row. To assist in proper row alignment, lines could be painted on the floor. Another control may be to situate mirrors on the walls or ceiling above the storage area that would enable forklift truck operators to see the area in front of the load they are carrying.

Employers, together with employees who perform the task, should examine the facility for possible solutions to problems such as these and decide on their applicability and effectiveness in their plant. Solutions, or controls, that are implemented should be evaluated after a period of time to judge their effectiveness.

Recommendation #2: Manufacturers of forklift trucks should consider the following safety improvements: a) the addition of a guard on the front of the operator's area; and, b) connecting the seat safety switch to the hydraulic controls in such a way that the levers cannot be operated when the operator is not in the seat.

Discussion: Manufacturers should examine the possibility of placing a grating or other guard on the front of the operator's area. The grating could be designed such that the operator's vision would not be impaired, but that it would prevent the operator from reaching into harm's way. It would also prevent objects from falling back into the operating area. A high impact plastic may also be practical.

The seat safety switch disables the vehicle from motion, but does not prevent the load controls from operating. Obviously, the hydraulic system must continue to function to hold the load in place when the operator exits, but a method could be devised to prevent the inadvertent functioning of the levers. In this case, had the lever controlling the mast been disabled when the operator left the seat, he may not have been caught between the mast and the cage.

Recommendation #3: Employers should develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, a thorough hazard analysis and utilization of controls particular to the job.

Discussion: A comprehensive safety program begins with an analysis of hazards associated with the specific tasks to be done on the job, often called a Job Safety Analysis. It should also include the identification and implementation of controls for those hazards. All employees should be trained in the recognition of hazards and the implementation of controls. Controls can include changes in procedures, changes in equipment or use of personal protective equipment. Participation of employees should include regular meetings where employees are encouraged to raise safety issues that they face on a day-to-day basis.

Particularly in a high production environment where the same task is repeated throughout the day, employees may become more concerned with "getting the job done" than getting it done safely. For the operator in this case, the alternative to climbing between the mast and the cage of the forklift was to back his vehicle out of the row completely, exit the vehicle and walk either down to where the load was hung up or all the way around the other rows to the other side of the load. The operator chose what he saw as the quicker solution.

Although the operator had received the prescribed forklift operator training, that training is not likely to deal with specific problem situations encountered on the job. Regular safety meetings where the safety concerns of management and employees are openly discussed enables employees to make better decisions regarding how to safely perform their jobs. If loads hanging up in the narrow aisles were a frequent problem, this may have come up in a regular safety meeting and solutions could have been developed for the problem.

REFERENCES

American National Standards Institute, Safety Standard for Low Lift and High Lift trucks, ASME B56.1-1993

Code of Federal Regulations, Labor 29 Parts 1910.178, Powered Industrial Trucks

U. S. Department of Labor, OSHA Web Site, *www.osha.gov*

U. S. Department of Labor, OSHA, Draft Proposed Safety and Health Program Rule, 29 CFR 1900.1 See *www.osha-slc.gov/SLTC/safetyhealth/nshp.html*