January 7, 1997

Nebraska FACE Investigation 96NE051

SUBJECT:

Forklift Overturn

SUMMARY:

A 35-year-old truck driver was killed when the forklift he was steering tipped over. The forklift had become stuck in the dirt and a coworker was attempting to pull it out with a truck. The chain was attached to the cage of the forklift instead of the pintle hook. When the coworker pulled the truck forward, the forklift tipped over, crushing the victim's head under the roll bar. The victim was not wearing a seat belt at the time of the incident.

The Nebraska Department of Labor investigator concluded that to prevent future similar occurrences:

* Employers must ensure that all forklift trucks are equipped with seat belts and enforce their use.

* Employers and employees must ensure forklifts are only operated on surfaces for which they are intended.

* Employers should develop\review safe towing procedures for forklifts to include proper attach points for towing.

* Manufacturers of forklifts should consider a redesign that would incorporate a "pull-down bar" which would secure the operator in the event of an overturn.

PROGRAM OBJECTIVE:

The goal of the Fatality Assessment and Control Evaluation (FACE) workplace investigation is to prevent work-related deaths or injuries in the future by a study of the working environment,

the worker, the task the worker was performing, the tools the worker was using, and the role of management in controlling how these factors interact.

This report is generated and distributed **solely** for the purpose of providing current, relevant education to employers, their employees and the community on methods to prevent occupational fatalities and injuries.

INTRODUCTION:

On November 8, 1996, at approximately 10:30 a.m., a 35-year-old truck driver was killed when the forklift he was steering tipped over while being extricated from the dirt. The Nebraska Department of Labor was notified of this fatality by the company experiencing the fatality on November 8, 1996. The Nebraska FACE investigator met an OSHA investigator at the incident site on November 8, 1996. The site investigation was conducted on November 8, 1996 and November 12, 1996. Interviews were conducted with the company's Regional Safety Supervisor, Operations Manager, Service Center Manager and employees.

The employer is a trucking company that has been in business for 61 years. The company employs 37 people at this jobsite and approximately 14,000 nationwide. This was the first fatality at this jobsite which has been in business for 10 years. The company has full-time regional safety supervisors. This jobsite does not have a full-time safety manager, it is a duty shared by management personnel The company has a written safety program and provides forklift training and certification for its forklift operators.

The victim had been employed by this company for four and one-half years. He had documented forklift training and certification.

INVESTIGATION:

On the day of the incident, the victim came to work around 9:30 a.m. A coworker needed to get a pallet jack out of one of the semi trailers in the yard. A forklift was obtained to lower the pallet jack. The trailer the pallet jack was in was parked on asphalt but was backed up very close to a grassy area (figure 1). After the pallet was removed from the truck and lowered it appeared the forklift was backed into the grassy area and became stuck in the dirt. In the first attempt to get

the forklift out of the dirt, one end of a chain was attached to a metal bar, which protected the radiator of the forklift, and the other end to the ICC bar on a trailer. The coworker got into the cab connected to the trailer and attempted to pull the forklift out of the dirt. The bar broke loose from the forklift. On the next attempt one end of the chain was attached to the left rear support arm of the rollover cage on the forklift (figures 2&3), and the other end to the ICC bar on the trailer. From the chain marks on the ICC bar and the support arm of the forklift it appears the trailer and the forklift were at approximately a 90-degree angle to each other (figure 1).

The forklift's rear wheels (below where the chain was attached), are 17" in diameter and 6" of the wheel was buried in the dirt. When the coworker attempted to pull the forklift out this time, it flipped over on its side, throwing the victim onto the asphalt. The top of the rollover cage bar came down on his head. After the forklift flipped over the bottom half was on the grass and the rollover cage was on the asphalt (figure 3). Personnel on site immediately called 911 who responded in several minutes. The victim was pronounced dead at the scene at 10:26 a.m.

CAUSE OF DEATH:

The cause of death as stated on the death certificate was massive blunt trauma to head, with crushing injury of skull and extensive laceration of brain.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: **Employers must ensure that all forklift trucks are equipped with seat belts and enforce their use.**

Discussion: Had a seat belt been available and used this fatality might have been prevented. Had a seat belt been worn it should have held the victim within the confines of the rollover cage structure therefore preventing his head from being struck by the rollover cage top bar. It appeared this forklift was originally equipped with seat belts and they had been removed. All forklifts should be checked and retrofitted with seat belts as appropriate.

Recommendation #2: **Employers and employees must ensure forklifts are only operated on surfaces for which they are intended.**

Discussion: The incident forklift, which was equipped with solid rubber tires (19" diameter by

6" width in the front and 17" diameter by 4" width in the rear) is designed to only be used on hard surfaces. Had the forklift never been driven onto the grass, this fatality could have been avoided. Proper operating surfaces for forklifts should be discussed in forklift training. The trailer from which the pallet jack was being removed was backed up very close to the grass. Had this trailer been moved forward the pallet jack could have been removed without the forklift leaving the paved area.

Recommendation #3: **Employers should develop\review safe towing procedures for forklifts to include proper attach points for towing.**

Discussion: All personnel using forklifts should be aware of the proper way to tow a forklift. This particular forklift did not have a pintle hook installed at the time of the incident (which would have been the proper attach point for towing), and this probably contributed to the incident. It was apparent an initial attempt was made to attach the chain low on the forklift, which would be proper due to its low center of gravity. However, it was hooked up to a metal bar which was not designed as an attach point and which broke off the forklift when an attempt was made to tow it. Furthermore, the forklift was pulled at an angle of approximately 90 degrees from the tow vehicle. The towing vehicle should have been in line with the forklift. This could have prevented it from overturning.

Recommendation #4: **Manufacturers of forklifts should consider a redesign which would incorporate a "pull-down bar" which would secure the operator in the event of an overturn.**

Discussion: Talking to many forklift operators at different companies, I have found their largest complaint with wearing seat belts is the number of times they get on and off a forklift in a shift. If a simpler system for restraint was incorporated into the design of forklifts, more lives could possibly be saved. A "pull-down bar," such as the kind used in many skid steer loaders, appears to be a viable option to seat belts. This restraint could be designed so the drive line could not operate unless the bar is in the down and locked position.