March 19, 2002

Nebraska FACE Investigation 01NE038

SUBJECT:

Construction Worker Caught Between Forklift and Cement Truck

SUMMARY:

A 71-year-old construction worker was killed when the forklift he had been operating rolled forward, pinning him against the rear of a cement truck. The victim had gone to the local redi-mix concrete company earlier that morning and had driven the full concrete truck to the job location. He positioned it in an alleyway behind and adjacent to the work site and walked across an adjoining roadway to where the forklift involved in the incident was parked. With the assistance of his supervisor (company owner), he attached a cement bucket onto the forks. The supervisor walked away towards his truck while the victim drove the forklift back across the street and parked it directly behind the cement truck. He then exited the forklift and stepped in between the forklift and concrete truck to adjust the concrete chute on the rear of the truck. The forklift rolled forward, pinning the victim's abdominal area between the concrete bucket and the extended rear platform of the truck. Two workers heard him scream and were able to push the forklift backwards off of the victim. The supervisor also heard the victim, ran to the scene and immediately provided first aid until the two workers took over. He then ran a short distance away where an ambulance was kept and brought it to the accident site. The victim was transported by the local rescue squad to a hospital 32 miles away where he was pronounced dead later that morning.

The Nebraska Workforce Development, Department of Labor's Investigator concluded that to help prevent future similar occurrences, employers should:

- Develop, implement and enforce a forklift training program for all employees that may operate such equipment.

- Ensure that all equipment has an established maintenance program as recommended by the manufacturer.

- Develop, implement and enforce a comprehensive safety program that includes, but is not limited to, training in all hazard recognition.

PROGRAM OBJECTIVE:

The goal of the Fatality Assessment and Control Evaluation (FACE) workplace investigation is to prevent future work-related deaths or injuries, 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, 2001, at approximately 8:15 a.m., a 71-year-old construction laborer died after the forklift he was operating rolled forward, pinning him against the rear of a cement truck. The Nebraska Department of Labor was notified of the fatality the same day by the Occupational Safety and Health Administration (OSHA). The Nebraska FACE Investigator met with the investigating OSHA Compliance Officer (COSHA) on November 20, 2001. On January 16, 2002 the investigator met with company officials, employees, and local law enforcement personnel at the mishap location.

The victim's employer is a construction company now doing mainly slab and basement work. They work on both residential and commercial projects. They had been in business as a registered construction company for 25 years. At the time of the mishap the company employed three laborers, including the victim. The victim's company did not have a written safety program. The owner acted as the company's safety representative. "Tailgate Talks" were sometimes conducted, but none were documented. Any training given to employees was done verbally and/or "hands-on" with no documentation. The employer had no previous history of fatalities.

INVESTIGATION:

Victim: The victim was a 71-year-old male. He had been employed by this company (company #1) for almost 8 years since retiring as a lumberyard manager for over 40 years. He was hired to perform "job cost estimating" and general construction tasks.

Training: No pre-job formal training for the victim on the mishap equipment could be established. Upon hire, the victim was given the same "hands-on" and verbal training as the other employees for any equipment he may have been unfamiliar with. The company owner (supervisor) stated that he had not given the victim any formal forklift training, since he had operated forklifts for over 40 years at his previous job. The company did not have a formal safety/training plan.

Equipment: The forklift is owned by a masonry contractor that had sub-contracted with the victim's employer, while the cement truck is owned by a local redi-mix concrete company.

> The masonry company had been in business since 1984. The company did not have a formal safety plan or documented training program. No formal training had been provided for any of their employees on the use of forklifts. There were no maintenance records available, nor were there any daily pre-operation maintenance check lists. The owner stated the forklift had been on the job site for about a week, and he was unaware if the victim had operated it prior to the mishap. The masonry contractor had employees there during the week to operate their equipment, including the forklift. Two of this company's employees arrived on site the morning of the accident just as the victim was moving the forklift across the street. The forklift is a John Deere 480 that was manufactured in the 1970s, exact age unknown. It was purchased in 1988. The owner stated that to his knowledge they had not had any mechanical problems with it. The

forklift was removed from the job site the same day as the accident and was not available for the FACE investigator to see.

The FACE investigator met with John Deere service representatives on February 7, 2002 to discuss the possible causes of this incident. A review of the service and operator's manuals for this particular piece of equipment showed that there was no separate hand/emergency brake installed during the manufacture on this particular model. There are two separate shift levers used to place the forklift in PARK. The Gear shift lever is located on the left side of the operator's seat. It has 8 different gear ranges. These are dispensed in an "H" pattern. The Range shift lever is located on the right side of the operator's seat. It has three positions, a HIGH RANGE (upper right), PARK (lower right) and LOW RANGE (lower left). For this forklift to have been placed into a PARK mode, the gear shift lever must be placed in any gear, and then the range shift lever moved into the PARK position. If the Range shift lever is in either low or high range, and the gear shift lever is in the "neutral" or middle position, the forklift would be in neutral, allowing it to roll and be pushed

The redi-mix concrete company's truck was a 1984 Ford truck cab and frame with a full sized cement hopper/tumbler on the back. The company owner stated that the victim was allowed to drive the truck that morning, because he had considerable experience in operating this type of vehicle and had worked for the company previously. At the time of the mishap, the truck's transmission was in PARK, and the emergency brake in the ON position.

Worksite: The construction company was adding an addition to the rear of a grocery store. The alleyway where the incident occurred is at the rear of the store. The alleyway is concrete and fairly level, although it was cracked in numerous locations. The outer edges have a slight "cupping" or "lip", especially noticeable where the concrete meets the gravel driveway of an adjoining business's parking lot.

ANALYSIS/SYNOPSIS:

On the morning of the incident, the victim went to a local redi-mix concrete company and drove one of the company's mixer trucks to the job site. He parked the truck in the alley behind the grocery store where the crew was constructing the addition. He placed the transmission in PARK and set the emergency brake. The truck was at a very slight angle with the alley, with its nose pointing toward the northwest. The victim then walked south across the street to where the forklift was parked. His boss helped him put the concrete "bucket" on the forklift forks. As the victim was backing the forklift up, his boss turned away and walked west towards his vehicle to retrieve his gloves. The victim drove the forklift north across the road into the alley, positioning it several feet directly behind the concrete truck with the forks 2-3 inches off of the ground. The rear wheels of the forklift may have been positioned on the roadway lip where the concrete and rock meet. The victim got down from the forklift. It could not be determined what position the shift levers were in, but for the forklift to roll, the gear shift lever must be in the neutral position. The victim left the forklift running, exited and walked around to the front, positioning himself between the cement bucket and the rear of the cement truck. He was adjusting the concrete chute on the rear of the truck when the forklift rolled into him, pinning his abdominal area between the concrete bucket attached to the forklift and concrete truck's extended rear frame below the chute. He screamed and was heard by his boss and two workers directly above the vehicles on scaffolding. All three rushed to his aid. The two workers pushed the forklift back away from the

victim without moving any levers. This would also suggest that the gear shift lever was in the neutral position. First aid was being provided by the supervisor. The victim became unconscious and stopped breathing. CPR was initiated by the two workers while the victim's supervisor ran to the local rescue barn to get the ambulance. Other employees were also summoning help at this time. Rescue personnel arrived within minutes and immediately transported the victim to the closest hospital, approximately 35 miles away. He was pronounced dead 2 hours later.

Conclusion: For the forklift to roll forward, the gear shift lever had to be in the NEUTRAL. The fact that the forklift's rear wheels were on an elevated lip at the road edge coupled with the vibration of the running forklift might have contributed to the forklift rolling forward.

CAUSE OF DEATH:

According to the death certificate, the cause of death was Internal Bleeding/Lower Abdominal Internal Trauma/Compression Injury to Body.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: Employers should ensure that each powered truck operator is competent to operate a powered industrial truck safely.

Discussion: The victim had never received formal training in the proper operation of a forklift from his current employer. Even though the victim may have operated similar equipment for many years, it can not be assumed that he knew the proper operation and safety requirements for this forklift. This training must be given under the direct supervision of a person that has the knowledge, training and experience to train operators and evaluate their competence. This training consists of a combination of formal instruction (e.g. lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee) and evaluation of the operator's performance in the workplace. This training would include operating the forklift according to manufacturer's specifications, such as turning off equipment before dismounting, setting the gear and range levers in PARK, etc. Certified forklift training is available through manufacturer representatives, local colleges, insurance carriers, etc.
(CFR 1910.178(l))

Recommendation #2: Employers should establish a routine maintenance program for all equipment to meet or exceed regulatory requirements.

Discussion: The masonry contractor did not have a written/documented maintenance program available for their forklift. This machine should have been examined prior to being placed in service at the beginning of every shift. If the exam would have shown any condition(s) adversely affecting the safety of the forklift, it should not have been used. This visual and mechanical inspection should be done on a daily basis or at the beginning of a shift if it is used on an around-the-clock basis.
(CFR 1910.178(q)(7)

Recommendation #3: Employers should provide a safe and healthful workplace, free from recognized hazards by developing, implementing and enforcing formal safety programs.

Discussion: The victim's employer did not have written, formal safety programs. Hazards associated with particular jobs were verbally discussed, but not documented. The employer should 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 illness or injury.
(CFR 1926.21(b)(2)

ATTACHMENTS:

Figure #1: Diagram of accident site.
Picture #1: Owners manual for John Deere 480 Forklift showing lever locations.
Picture #2: Gear shift lever with shifting diagram from owners manual.
Picture #3: Range shift lever with shifting diagram from owners manual.
Picture #4: Area where forklift and cement bucket were stored. Taken shortly after the accident.
Picture #5: Alleyway where accident occurred looking south. Taken 01/16/2002.
Picture #6. Forklift with cement bucket on forks and rear of cement truck. Note the frame extension on the rear of the cement truck. Taken shortly after the accident.
Picture #7: Forklift and cement truck taken shortly after accident.

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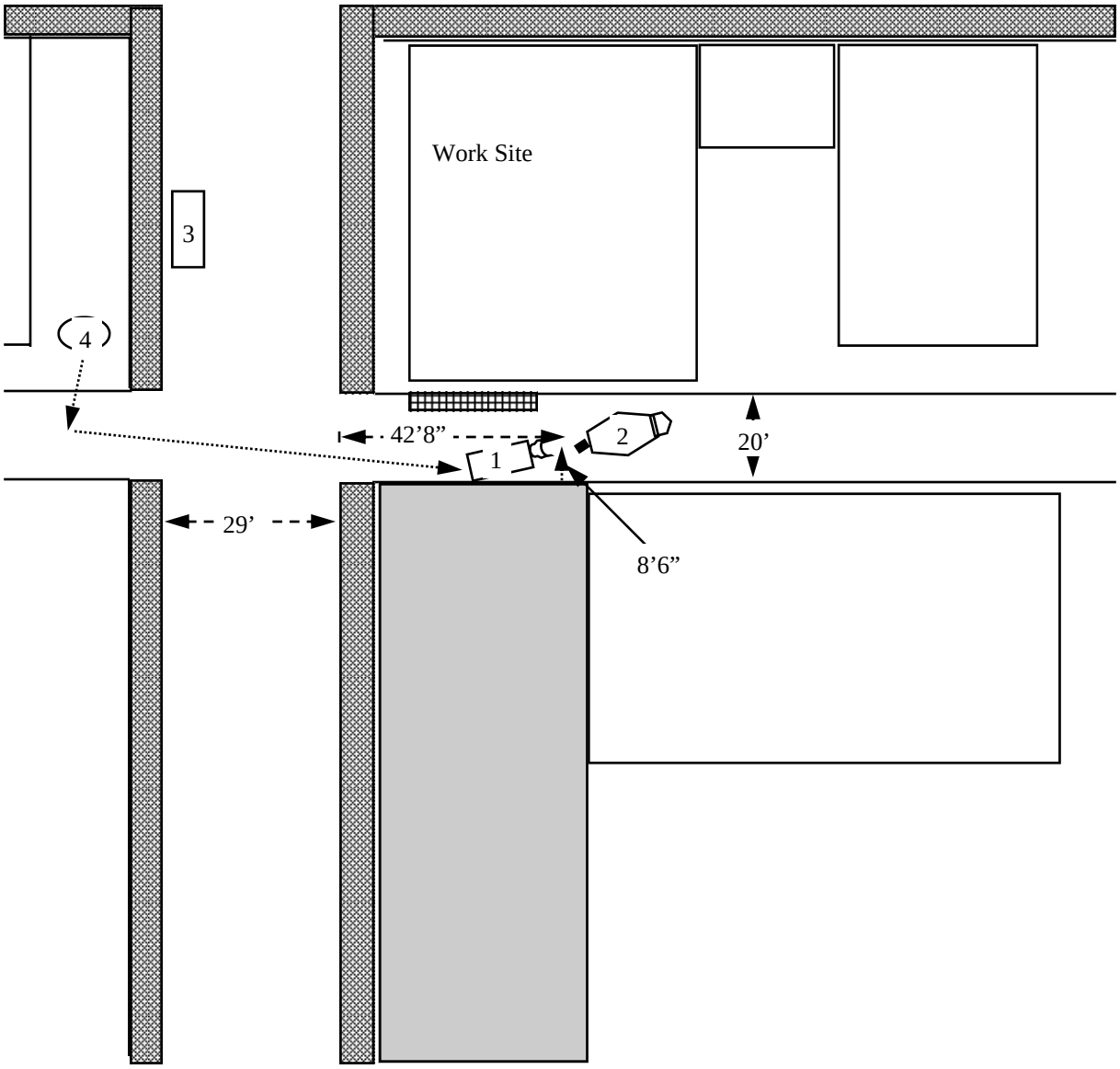

Sidewalk

Scaffolding

Gravel parking lot

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1 Forklift

2 Cement Truck

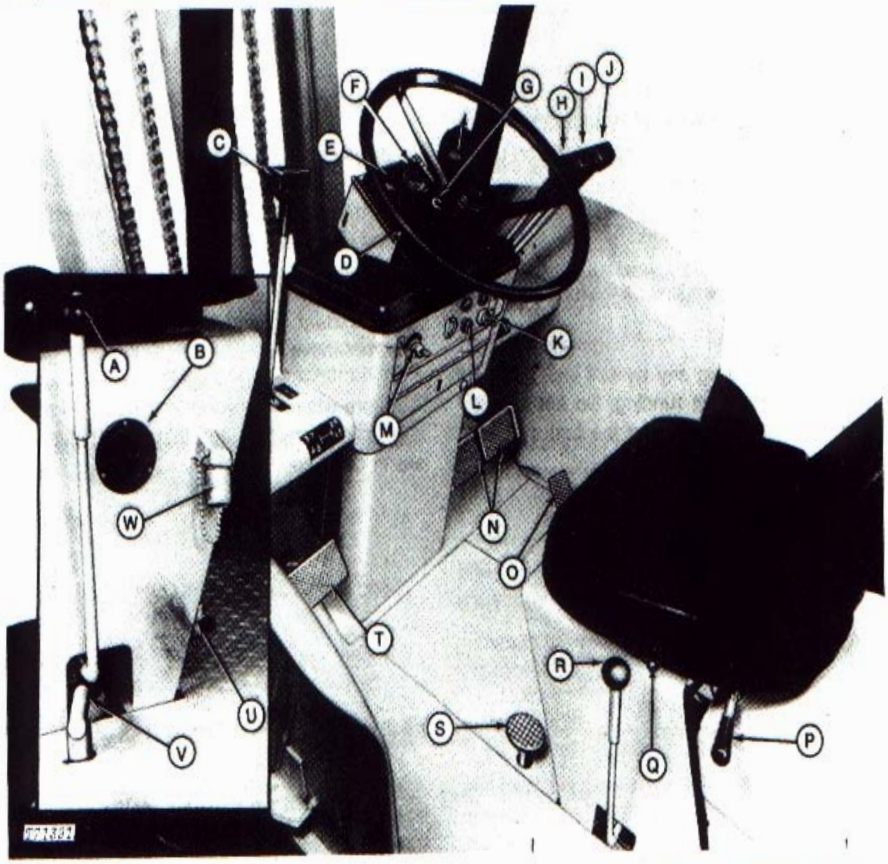
3 Supervisor’s Truck

4 Forklift starting point

JOHN DEERE

Controls and Instruments

Before operating the forklift, learn the location and purpose of all controls and instruments.



A—Range Shift Lever
B—Hour Meter
C—Reverser Control Lever
D—Alternator Indicator Light
E—Coolant Temperature Gauge
F—Fuel Gauge
G—Engine Oil Pressure Indicator Light
H—Lift Lever
I —Tilt Lever
J —Side Shift or Allied Equipment Control Lever
K—Key Switch
L —Horn Button
M—Light Switch
N—Brake Pedals
O—Foot Throttle
P—Hand Throttle
Q—Seat Adjustment Lever
R—Gear Shift Lever
S—Differential Lock Pedal
T—Clutch Pedal
U—Transmission Filler Cap
V—Clutch Disconnect Lever
W—Starting Fluid Adapter

Photo #1: Control and Instruments for the John Deere 480 Forklift

Picture # 6: Forklift and cement truck shortly after accident.

Picture #7: Forklift facing north towards cement truck, taken shortly after accident.

Picture #8: Shows adjacent gravel parking lot is slightly higher in elevation than alleyway.

Picture #9: Shows adjacent gravel parking lot and alleyway, taken from spot where victim was located, looking south.