

June 1, 2006

Nebraska FACE Investigation NE 2002-28

SUBJECT:

Concrete Block Truck Operator Struck by Falling Pre-Cast Steps

SUMMARY:

A 72-year-old male truck driver sustained fatal injuries when struck by a 1,500 pound pre-cast concrete step unit that broke loose and fell while being hoisted above him. The victim was part of a two-person crew that transported and delivered a set of pre-cast concrete steps to a residence. The victim was operating the truck-mounted loader. As he lifted the steps to the driver's side of the truck he abruptly stopped their movement. The load continued to swing, became unsteady and broke free of the clamps used to secure the steps. The steps then fell onto the victim causing severe injuries. Emergency personnel were immediately summoned and the victim was transported to a hospital where he died eleven days later.

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

- **Ensure loads are not being lifted near, over or in the vicinity of any employee(s).**
- **Train all employees in the recognition & avoidance of hazards.**
- **Ensure rigging and other equipment being used is suitable for the intended load.**
- **Ensure that employees are operating the loader in a manner that prevents sudden acceleration or deceleration of the moving load.**

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 May 7, 2002, at approximately 9:00 a.m., a 72-year-old male truck driver received serious injuries which resulted in his death eleven days later after being struck by a 1,500 pound piece of pre-cast concrete steps. The Nebraska Department of Labor was notified of the fatality on May 21, 2002, by the OSHA duty officer in the Omaha area office. The Nebraska FACE Investigator met with the investigating OSHA Compliance Officer (CSHO) on May 24, 2002. No site visit was conducted.

The victim's employer is a Ready-Mix concrete (SIC Code 3273) company. The company has been in business for over 20 years. At the time of the incident the company employed approximately 8 employees. The company had a written safety and health program. The company is owned by a corporate company that has a professional safety director who visited the victim's company 2 to 3 times per year. The victim's company had no previous history of fatalities.

INVESTIGATION:

Personnel:

Victim: The victim was a 72-year-old male. He had been employed by this company since April 1985, as a truck driver. He was considered the most experienced at operating the truck involved in the incident and had performed the assigned task of delivering similar sets of steps approximately ten times per year.

Training: The employer does have a written safety & health program which included new employee orientation and safety awareness training. In the written program there is approximately two-thirds of a page that specifically addresses the use of the "block truck" like the one involved in the incident. It is not known if the victim was aware of this information or received a copy of the manual during his initial hiring process. The victim's company used an "on-the-job" training philosophy for physical tasks. Company personnel did not remember any training being given to the victim in recent years due to his level of experience.

Equipment:

Truck: 1995 Mack, flatbed (block truck). It is operated approximately 2 times per week for 4 hours per run. Two persons, including the victim, are qualified to operate this truck, and one more employee was in training at the time of the incident.

Truck-mounted loader: Prentice Hydraulic, mounted at the rear of the truck's flat bed.

ANALYSIS/SYNOPSIS:

The victim (worker #1) was part of a two-person crew tasked to transport and deliver a pre-cast concrete step unit to the rear of a residence. The single-piece step unit consisted of three steps and a landing. The steps were 48 inches wide (1 ¾" thick) and the landing 42 inches wide (3" thick), weighing approximately 1,500 pounds total.

The victim and worker #2 arrived at the rear of the house and proceeded to unload the steps. The steps were to be lifted over a fence then sat in place. Worker #2 was standing at the rear of the truck, while the victim was standing on the driver's side near the rear wheels, approximately two feet away from the truck's bed.

The step unit was to be lifted using a company-manufactured clamping system. This set of clamps, which had been in use by the company for over 10 years, consisted of 2 brackets which attached to two opposing sides of the steps. The clamps have a lip which is placed under the beveled edge of the concrete steps. The clamps were held in place by a chain stretched between the two clamps.

The victim attached the loader's hook to the center of the chain. As the steps were lifted, tension was applied to the chain, causing the clamps to be drawn together, essentially squeezing the steps and allowing them to be lifted.

One drawback to this system is that if the tension is released or decreased for any reason, the load becomes unstable and may slip out of the clamps/rigging. Because of this, the load must remain level at all times or the steps will slide out of the clamps.

The boom speed can be adjusted to 5 levels. Witnesses stated that the boom speed was set at 5, the highest speed. Note: During the investigation, the investigating CSHO observed the movement of the boom at the "5" speed setting, stating that "starting and stopping" was very abrupt and sudden. The movement created a "jerky" motion which allowed excessive boom and load swing.

Using a wired-remote control unit, the victim raised the stairs off of the truck's bed and swung them toward the driver's side of the truck where he was standing, stopping the movement just as it cleared the outside edge of the truck's bed. The abruptness of the sudden stop caused the stairs to continue to swing outward. When they reached the apex of the swing arc, the chain holding the clamps tight was no longer taut. This allowed the clamps to release the stairs, causing them to fall onto the victim.

Local emergency personnel were notified and responded within minutes. The victim was treated on-scene for a fractured right hip. He was then transported to a hospital where he

died eleven days later from a blood clot that became lodged in his heart, causing cardiopulmonary arrest.

During the investigation, both the truck and loader were found to be in good working order.

CAUSE OF DEATH:

According to the death certificate, the cause of death was: *Blunt force trauma to the body.*

RECOMMENDATIONS/DISCUSSION:

- **Recommendation #1: Ensure loads are not being lifted near, over or in the vicinity of any employee(s).**

Discussion: Job sites, personnel and the tasks to be performed must be arranged to ensure that all loads being hoisted in the vicinity of any employee(s) ensures an adequate safety zone in the event the hoisted load should fall.

Reference: 29 CFR 1910 OSHA General Industry Regulations, para. 1910.180(h)(3)(vi), February 1, 2004: *The operator should avoid carrying loads over people.*

Reference: 29 CFR 1910 OSHA General Industry Regulations, para. 1910.180(h)(4)(ii), February 1, 2004: *No person should be permitted to stand or pass under a load on the hook*

- **Recommendation #2: Train all employees in the recognition & avoidance of hazards.**

Discussion: Being able to recognize, avoid and prevent unsafe job site conditions that workers are exposed to during their daily tasks will ensure accidents such as this do not occur again. Witnesses stated that the steps were covered with moisture from rain the night before and the morning's dew, which may have affected the integrity of the rigging system, allowing the load to slide from the clamps as easily as it did.

Reference: 29 CFR 1910 OSHA General Industry Regulations, Addendum: Safety and Health Management Guidelines, Issuance of Voluntary Guidelines – 54:3904-3916(c)(4)(i), February 1, 2004: *Safety and Health Training. Ensure that all employees understand the hazards to which they may be exposed and how to prevent harm to themselves and others from exposure to these hazards, so that employees accept and follow established safety and health protections.*

- **Recommendation #3: Ensure rigging and other equipment being used is suitable for the intended load.**

Discussion: Hooks, rings, oblong links, pear shaped links, welded or mechanical coupling links or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component. Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used. Company personnel stated that the clamps involved in this incident had been manufactured and in use by the company for over 10 years. They were unaware of any data showing the design criteria, approval and/or load rating of the clamps.

Reference: 29 CFR 1910 OSHA General Industry Regulations, para. 1910.184(e)(2)(i-ii), February 1, 2004.

- **Recommendation #4: Ensure that employees are operating the loader in a manner that prevents sudden acceleration or deceleration of the moving load.**

Discussion: During hoisting care shall be taken so that there is no sudden acceleration or deceleration of a moving load that could cause an unexpected release of the load. Loader operators should be trained using all available materials, including the equipment manufacturer's operating manuals. Company personnel were aware of the existence of an operator's manual for the truck and loader, but were unaware of its location. The plant manager stated that he had not been on a job site to observe the victim operate this truck in over a year, although he would see him loading materials in the "yard". He felt there was no need for observation due to the victim's experience level.

Reference: 29 CFR 1910 OSHA General Industry Regulations, para 1910.180(h)(3)(iii)(a), February 1, 2004.

KEYWORDS: Construction

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