March 23, 2006

Nebraska FACE Investigation 97NE011

SUBJECT:

Worker Crushed by Equipment Support Leg

SUMMARY:

A 53-year-old truck driver was killed when a 1,010 pound support arm fell on him. He was in the process of setting up a portable rubble plant which is used for crushing concrete. Part of the setup involves rotating a support leg 90 degrees from the transport position to the stationary position. The support leg pivots from the transport position to the stationary position on a 3 ½" bolt with a one-inch diameter. The threads on the bolt stripped and the nut fell off allowing the support arm to fall on the victim.

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

* Employers should ensure that procedures are available for setting up and breaking down the portable rubble plant.

* Employers should ensure a periodic inspection schedule is developed for checking the condition of the portable rubble plant, which includes checking the condition of the bolts/nuts and/or pivot device on the support leg.

* The manufacturer of the portable rubble plant should consider a redesign which would provide a safer pivot point for the support leg.

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 May 20, 1997 at approximately 6:10 p.m., a 53-year-old truck driver was killed when a support leg on a portable rubble plant he was helping set up fell on him. The Nebraska Department of Labor was notified by OSHA on May 21, 1997. Information for this report was obtained from meetings with the OSHA Compliance Safety and Health Officer and a representative from the victim's company.

The employer is a concrete and asphalt recycling operation. The company employs approximately 45 people (this varies seasonally). This was the first fatality in the history of the company which has been in operation since 1988. The company has a written safety program and a part-time safety manager.

The victim had been employed by the company for three weeks and this was his first day on this particular jobsite.

INVESTIGATION:

On the day of the incident, the victim had transported the portable rubble plant from another location to the incident location. The rubble plant was being used as part of a major highway construction project. This victim's company was a subcontractor on a multi-employer worksite. At the time of the incident the victim and a coworker were setting up the rubble plant. During transportation the support leg is in the horizontal position (figure 1). During setup the leg is rotated 90° to the vertical position. While being transported in the horizontal position the leg is secured by three bolts (figure 2). During normal setup, two of these bolts (bolts 2 and 3 in figure 2) are removed and the leg pivots on one bolt (bolt 1 in figure 2). After the leg is rotated to the vertical position it is secured with eight bolts.

At the time of the incident, bolts 2 and 3 had been removed and the leg was pivoted on bolt 1 to the vertical position. When the victim and the coworker began to install the other seven bolts the nut came loose from bolt 1 and the leg fell to the ground, striking the victim. The nut that was on the bolt stripped off allowing the leg to fall. The bolt was 3 ½ inches long with a 1 inch diameter. The support leg is 10' 1" long and weighs 1,010 pounds. The portable rubble plant is three years old, was purchased new and this was an original bolt. The bolt being used as the pivot point was threaded the entire length of the bolt. The pivoting up and down of the leg with the nut tightened could have resulted in the stripping of the nut. The bolt showed wear at the pivot point. The incident occurred at 6:10 p.m. and the victim was pronounced dead at 6:47 p.m. the same day.

CAUSE OF DEATH:

The cause of death as stated on the death certificate was massive blunt trauma to the head.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: **Employers should ensure that procedures are available for setting up an breaking down the portable rubble plant.**

Discussion: Procedures for setting up and breaking down the rubble plant should be available and they should be briefed to all individuals involved in setting up and/or breaking down the rubble plant. These procedures should address slightly loosening the nut on the pivot bolt before pivoting the support arm. This should decrease the wear on the bolt and nut. Also personnel should be aware of the danger of the support leg falling. A safety chain around the support arm and the frame of the rubble plant to which it is attached would add of measure of safety while pivoting the support arm. Another possibility to enhance safety in this procedure would be to use a capscrew bolt with the pivot area unthreaded.

Recommendation #2: **Employers should ensure a periodic inspection schedule is developed for checking the condition of the portable rubble plant to include checking the condition of the bolts/nuts and/or pivot device on the support leg.**

Discussion: The manufacturer's operator's manual states that *"the plant should be inspected daily to see that all bolts are tight due to vibrations during operation. They must be retightened if found loose".* The company was actually doing this check three times a day. The manual just mentions checking for tightness of the bolts and does not specifically mention checking the pivot bolts. To adequately check the pivot bolts and nuts they should be removed and checked for wear.

Recommendation #3: **The manufacturer of the portable rubble plant should consider a redesign which would provide a safer pivot point for the support leg.**

Discussion: A possible redesign of the plant could incorporate a pivot pin in the center of the support leg itself. Another possibility would be to use a pivot pin in place of bolt 1 during movement from the horizontal position to vertical and from vertical to horizontal. For transport and operation the pivot pin could be replaced with a bolt and nut.