

Welding Service Owner Crushed by Conduit in Wyoming

SUMMARY

A 48 year old male welding service owner died from injuries suffered when a 5' concrete conduit pipe dislodged from a crane lift and dropped onto him, crushing him between two pieces of conduit. The victim was serving as supervisor for a project to install a man-hole access on a city street. Pieces of concrete conduit, 5' high by 4' in diameter, were being lowered into place using a trac-hoe. Two pieces of conduit had been successfully placed and a third piece was being lowered. In order to line up the rungs, the victim had climbed inside the placed conduit pieces by standing on the metal rungs inside the conduit as the third piece was lowered into place.

The third piece was lowered into place, but the rungs were not properly lined up, so the victim signaled the crane operator to lift and replace the third piece. As the piece was being lifted it became disengaged from the crane and fell, crushing the victim between the second and third piece of conduit. The piece of pipe was immediately re-rigged and lifted and emergency personnel were notified. The victim was transported by ambulance to a local hospital where he was pronounced dead.

Employers may be able to minimize the potential for occurrence of this type of incident through the following precautions:

- **Lifting equipment for heavy-duty crane operation should be adequate for the job and properly secured**
- **Regular safety meetings and review of safety procedures should be available to all employees**
- **Special care should be taken when projects are beyond a deadline to insure that unsafe practices are not used as time saving shortcuts.**

INTRODUCTION

On a Monday afternoon, October 25, 1993 the owner/operator of a welding service was serving as foreman of a crew that was under contract to install new man-holes for sewer lines and to replace old water and sewer lines for the city. The operation that was being conducted at the time of the incident consisted of placing 4' by 5' sections of concrete conduit in place for use as a man-hole access. The pieces were being lowered into place using a trac-hoe rigged with two steel chains approximately ten feet long and a steel bar approximately 4½' long. The steel bar was run through the concrete conduit, extending about 3" on each side of the piece of conduit. A chain was wrapped around each end of the bar, and a second chain was hooked to the midpoint of the first chain with a basket-type hitch. The second chain was then attached to the bucket of the trac-hoe, from which the conduit could be raised or lowered by operating the trac-hoe bucket arm.

Two pieces of conduit had been successfully lifted and lowered into place. Since the height was now too great for the supervisor to line up the rungs from the bank of the trench, he climbed inside the second conduit to direct the lowering of the third section of conduit. The third piece was lowered into place, but the inside rungs were not properly lined up to allow use of the rungs as a ladder for future access into the man-hole. The victim signaled the trac-hoe operator to re-lift the piece in order to re-set it properly. As the crane operator started to put tension on the chain sling the links caught momentarily and then gave way, causing the piece of conduit to slip off the steel rod and fall, pinning the victim between the two pieces.

INVESTIGATION

Through a reciprocal notification agreement with the Director of the Occupational Safety and Health Division of the Department of Employment, the WY- Wyoming FACE Project was notified of the incident on the morning of October 26. Reports were requested and an investigation was conducted.

The company had been under investigation by OSHA earlier in the month and cited for placing employees inside a trench without proper protection and for locating a spoil-pile too close to the trench sides.

The vehicle used for lowering the pieces of conduit into place consisted of a trac-hoe with a 10' chain mounted to the bucket and connected at the mid-point to a second chain in a basket hitch. The second chain was then connected to the two ends of a 4½" steel rod that was run through the concrete conduit piece. The rod was mushroomed on one end and smooth on the other, and protruded 3" on each side from the concrete conduit. The second chain was wrapped around each protruding end of the rod. The conduit was then raised and lowered by adjusting the height of the trac-hoe bucket by means of an hydraulic arm.

As the third piece of conduit was lowered into place, the chain slackened and loosened from the side away from the vision of the trac-hoe operator and other observers. The victim, who was inside the second conduit, saw that the ladder rungs inside the conduit pieces did not line up correctly and signaled to the trac-hoe operator to raise the conduit enough that he could physically turn it for correct placement and lowering. As the piece was lifted the chain tightened and caught momentarily on the edge of the bar, then came loose, causing the conduit to slip and fall back onto the conduit that was in place, but at such an angle as to force the victim against the side of the piece that was in place, and to pin him between the two sections.

Workers quickly re-attached the chain and moved the piece of conduit off to the side, and emergency services were called and responded within minutes. The victim was transported to a local hospital where he was pronounced dead.

CAUSE OF DEATH

The Medical Examiner listed the cause of death as massive trauma with hypotension as a result of a blunt force injury.

RECOMMENDATIONS/DISCUSSION

This incident could have been prevented by using a more secure means of raising and lowering the pieces of conduit. The system was makeshift at best, relying on a mechanism designed to shovel and lift buckets of dirt or rock rather than to raise and lower pieces of conduit into a trench. The rod that ran through the conduit was shorter than what should have been used, and the 3" protrusion on either side was not sufficient to permit slack and tightening of the chain. Companies involved in this type of work should ascertain that all connections are secure and capable of withholding slack and tightening movements.

FATAL ACCIDENT CIRCUMSTANCES AND EPIDEMIOLOGY (Wyoming FACE) PROJECT

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (Wyoming FACE) investigations when a participating state reports an occupational fatality and requests technical assistance. The goal of these evaluations is to prevent fatal work injuries in the future by studying the working environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact.

States participating in this study include: Kentucky, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

NIOSH Funded/State-based Wyoming FACE Projects providing surveillance and intervention capabilities to show a measurable reduction in workplace fatalities include: Alaska, California, Colorado, Georgia, Indiana, Iowa, Kentucky, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Wisconsin and Wyoming.

Additional information regarding this report is available from:

Wyoming Occupational Fatality Analysis Program
522 Hathaway Building - 2300 Capitol Avenue
Cheyenne, WY 82002
(307) 777-5439

Please use information listed on the Contact Sheet on the NIOSH FACE web site to contact [In-house FACE program personnel](#) regarding In-house FACE reports and to gain assistance when State-FACE program personnel cannot be reached.