The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research NIOSH

Welder Dies after Falling 22 Feet from a Roof at Mall Construction Site in Maryland

FACE 9019

SUMMARY

A welder fell 22 feet to the ground from a bundle of roof decking stacked on the roof of a mall under construction and died as a result of his injuries less than an hour later. The victim was welding bridging in place between roof bar joists when his welding cables became snagged. The victim stood on a bundle of roof decking and tried to free the cables by whipping them up and down and pulling on them. The welding cable connectors separated and the victim lost his balance and fell headfirst to the ground. Although the victim was wearing a safety belt and lanyard, he was not tied off at the time of the incident. Based upon investigation findings, NIOSH suggests that, in order to prevent future similar occurrences, employers should:

- **provide the necessary fall protection equipment and the means and training to properly use the equipment**
- **develop and implement safe methods for handling welding cables with employees**
- **develop and implement comprehensive safety training programs with task-specific safety procedures**
- **consider the use of other approaches, such as elevated work platforms, in reducing worker exposure to falls from elevations**

INTRODUCTION

On November 4, 1989, a 48-year-old welder died as a result of injuries sustained from a 22-foot-fall. On November 9, 1989, the Maryland Occupational Safety and Health Administration notified the Division of Safety Research (DSR) of the death, and requested technical assistance. On December 13, 1989, a DSR safety engineer conducted an investigation and met with a company official to discuss the incident. The DSR investigator photographed the incident site and reviewed emergency medical services (EMS) records.

The employer is a small construction welding company that has been in business for 10 years. The company has seven full-time employees, including five welders. The company has no safety officer and no written safety rules. Since this incident the owner has contacted his insurance company for assistance in developing a safety program.

The victim worked for this company only 5 days before the incident. He had 20 years of experience as a welder and had worked as a welding instructor in the local vocational technical school.

INVESTIGATION

The company had contracted to weld structural steel components at a new mall complex being built in the area. The victim was electric arc welding bridging between the roof bar joists which were 22 feet above ground. (Bridging is a system of lateral braces placed between joists to distribute the load on the roof, and hold the joists in position.) At the time of the incident, the victim was wearing a safety belt and lanyard. The victim, as well as the other welders, typically secured their lanyards to a structural member when working in one area for an extended period of time. Since the victim was only working in an area for a few minutes, he did not attach his lanyard to any structural member. The victim needed an additional foot of welding cable to complete the weld on a piece of bridging. When the victim pulled on the cables, he discovered they had become snagged. In an attempt to get the additional cable, the victim stood on the edge of a bundle of decking placed on the roof and whipped the cables up and down while pulling on them. As he did so, a welding cable connector came loose, causing the victim to lose his balance and fall backward through the bar joists to the ground (Figure). Witnesses stated that he landed on his head and shoulders.

Workers in the area saw the victim fall and called emergency medical services. The co-workers did not move the victim for fear of causing further damage. The rescue squad arrived about 12 minutes after the victim fell, placed the victim on a backboard with an immobilizer, and started cardiopulmonary resuscitation (CPR). The victim was transported to the local hospital where he died less than an hour after the fall.

CAUSE OF DEATH

The medical examiner's report stated that the cause of death was neck injuries sustained from the fall.

RECOMMENDATIONS/DISCUSSION:

Recommendation #1: Employers should provide the necessary safety equipment and means to properly use the equipment.

Discussion: 29 CFR 1926.18(a) requires an employer to ensure that employees properly use personal protective equipment when exposed to hazardous conditions. The victim was wearing a safety belt and lanyard, but was not able to tie off to a lifeline as none was present. After this incident, the employer installed lifelines to enable the people working at elevations to tie-off while working. Prior to this incident, the employer did not require workers to tie off when working at heights. The employer has since instructed his employees to tie off whenever they are working above 10 feet.

Recommendation #2: Employers should develop and implement safe methods of handling welding cables.

Discussion: When welding cables are caught, the correct way to handle the situation is to trace the cables back to where they are caught. Either the welder or a co-worker should check the cables to determine where they are caught, and free them if possible. A brief, periodic "toolbox" discussion of the proper methods of handling cables might have reinforced the victim's understanding of the need to take a few minutes to handle the cables in a safe manner.

Recommendation #3: Employers should develop and implement a comprehensive safety training program with task-specific safety procedures.

Discussion: There were no safety training or safety programs in effect. Since this incident, the employer has contacted his insurance company for assistance in establishing a written safety policy, a comprehensive safety training program, and task-specific safety procedures. In the past, the employer has relied on the previous experience of his employees to substitute for safety training. Safety training should address:

- care and inspection of the welding equipment
- personal protective equipment such as eye protection, safety shoes, clothing, fall restraints, etc.
- the need to tie-off while working at heights (particularly during work on structural components which are not always fully secured, as sudden movement may cause a worker to lose balance and fall).

Recommendation #4: Employers should consider the use of other approaches for reducing worker exposure to falls from elevations.

Discussion: Use of an elevated work platform, such as a scissors lift or other device, might have reduced the welder's exposure to this fall hazard. Another approach to fall protection would be the use of safety nets. An alternative method of construction would be to assemble sections of bar joists and bridging on the ground and then lift the completed sections into place, provided it would not expose workers to additional hazards.

REFERENCES

1. 29 CFR 1926.18(a) Code of Federal Regulations, Washington, D.C.: U.S. Government Printing Office, Office of the Federal Register.

2. OSHA Instruction STD 3-31 July 18, 1983 Fall Protection in Construction: 29 CFR 1926.28(a) and 29 CFR 1926.105(a)

Return to In-house FACE reports

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