



The National Institute for Occupational Safety and Health (NIOSH)

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Ironworker Dies Following a 25-Foot Fall through a Roof Opening

FACE 8913

INTRODUCTION

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatal Accident Circumstances and Epidemiology (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.

On December 14, 1988, a 41-year-old male ironworker died when he fell 25 feet after stepping through a roof opening.

CONTACTS/ACTIVITIES

Officials of the state Occupational Safety and Health Program notified DSR of this fatality and requested technical assistance. On January 26, 1989, a research industrial hygienist, safety engineer, and occupational health nurse from DSR interviewed a company official, conducted a site evaluation, and photographed the incident site.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The victim had been employed for about 18 years as an ironworker by a small construction company that has done steel erection services for 20 years. At the time of the incident about 60 people worked for the employer. Employees receive on-the-job training for the tasks they perform. The company has written safety rules, but does not have a safety officer. The job foreman is expected to act as the company's safety representative. A safety meeting was held at this jobsite on November 16, 1988 (the topic of the meeting is unknown). Although workers are required to furnish their own work shoes, the company supplies other safety equipment, such as gloves, hard hats and safety belts.

SYNOPSIS OF EVENTS

The victim was part of an eight-person crew that was finishing the steel erection for a six-story building. Steel decking had been installed on all lower floors and part of the roof. At the time of the incident, the crew had just come back from a break and was going to finish laying the formwork decking in the mechanical area on the roof. (The mechanical area contained the elevator penthouse, and heating, ventilation, and air conditioning equipment).

When members of the crew noticed that the victim had not returned to the roof, they started looking for him. This was about 5 minutes after the rest of the crew was back on the roof. They found the victim lying semiconscious on the fifth floor, where he had apparently fallen after stepping into a 2-foot-square stairway ventilation opening on the roof. Presumably he had picked up a 3-foot by 6-foot piece of decking that had been placed over the opening to keep workers from stepping into the hole. A piece of decking of similar dimensions was needed in the work area. The victim had earlier stated that he knew where such a scrap piece was located. The victim apparently fell about 18 feet onto the concrete stairs and then another 7 feet to the floor where he was found lying across a guy wire.

Upon finding the victim, one worker went to call for emergency help while the others tried to assist the victim. The emergency medical service (EMS) was on the scene within 10 minutes of being notified. Treatment provided on the scene included stabilizing the victim for possible spinal injury. The victim was transported to a trauma center by helicopter 1 hour after he had fallen. He died at the trauma center 12 hours later.

CAUSE OF DEATH

Although the medical examiner's report was not available at the time this report was prepared, the traumatic injuries sustained in the fall are presumed to have caused death.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: The employer should implement 29 CFR 1926.500(b)(8), which requires that all floor and roof openings be protected with standard railing or a floor hole cover secured against displacement.

Discussion: The roof opening was covered by a piece of decking which was neither secured in place nor identified as a protective covering. Thus, the victim picked up the decking without realizing it was covering an opening. Had the cover been secured in place and prominently labeled, it is less likely that the victim could have removed the cover and fallen through the opening.

Recommendation #2: Hazard analysis should be an ongoing part of each job phase.

Discussion: Before starting each phase of the job, the foreman needs to identify and review the potential hazards with the workers and discuss how the work can be done safely. These discussions should include information on hazards in the immediate work areas as well as information on the activities of other contractors on the site that could create hazards for the foreman's workers. Not only was the roof opening unguarded in accordance with 29 CFR 1926.500(b)(8), but the foreman also failed to inform the crew that he had placed a piece of decking over the stairway vent opening. This would have alerted workers of the opening underneath the piece of decking, and might have prevented this death.

Recommendation #3: The employer should consider cutting the roof openings as the last ironworking activity on the roof to help minimize exposure to this type of fall hazard.

Discussion: By cutting the roof openings as the last activity on the roof, the steel erector reduces the chance that a worker might step into one of these openings. At the time the openings are made in the roof, the steel erector should be required by contract to install covers which are secured in place and clearly labeled, so that other work crews on the roof will not be exposed to the potential fall hazard. The steel erection company foreman should check with the general contractor's representative on the jobsite to determine how the covers are to be secured and labeled. The general contractor will be responsible for the area after the erector leaves and needs to have some control over work activity at the roof opening(s). This can be done by labeling the cover and stating that the general contractor must be contacted for permission to work around the opening.

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