



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Ironworker Falls to His Death from a Steel Column

FACE 8815

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 March 28, 1988, a 35-year-old male ironworker died when he fell 60 feet from a steel column to a concrete pad.

CONTACTS/ACTIVITIES

State Occupational Safety and Health Administration officials notified DSR concerning this fatality and requested technical assistance. On April 6, 1988, NIOSH met with company representatives and witnesses, photographed the incident site, and contacted emergency services personnel in the city where the fatality occurred.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The employer in this incident, a multi-state construction company involved in steel erection work, had been in business since 1968. An earlier employee of this company was killed in a fall in 1980. The company currently employs 160 persons in various construction operations. Approximately 16 men were employed by the company at the site where this fatality occurred. Company policy requires that workers use a safety belt and lanyard at all times when working off the ground or when not on a properly protected floor. The victim in this incident was a professional ironworker with more than 10 years experience. Although the victim had been working for only 2 months at this construction site, he had previously worked for the same employer on numerous other construction jobs.

SYNOPSIS OF EVENTS

The victim was a 35-year-old ironworker who worked as a "connector." A connector performs the initial bolt-up of structural steel to hold the various beams and columns in place until they can be plumbed and permanently bolted. On the day of the incident, the victim was a member of a construction crew setting a tier of exterior steel columns for a large multi-story

building. The crew was in the process of setting a large 30-inch by 24-inch by 30-foot steel column. The column was 30 inches wide on the flange side, and the flanges were 6 inches thick. This column was to extend between the fifth and seventh floors of the building. Because of its size, two tower cranes were used to position the column. Once the column had been secured in position, it was necessary to disconnect the cables which were used to hoist and position the column. One cable was secured to the column at the lower end, while the other was attached to the upper end of the column approximately 90 feet above the ground.

In order to disconnect the upper cable assembly, the victim climbed the 30-inch-wide face of the column, holding on to the flanges. Since the flanges were 6 inches thick, the victim could not grip the flange as he could on a smaller column; rather, he had to pull himself against the column using body compression for his support. Witnesses state that as the victim neared the top of the column he reached above himself with his right hand to grab a lug located at the top of the column. He needed to hold this lug while he disconnected the hoist cable assembly from the column. The victim was unable to reach this lug, and as he reached back to grasp the flange, he began sliding down the column. As he approached the bottom of the column his right hand was observed to be out of contact with the flange. The victim's right leg struck the bottom collar of the column and the victim fell sixty feet from the column to a concrete pad below.

Fire department paramedics were called to the scene and arrived approximately 5 minutes after the fall. The victim was reported to be unconscious and in shock, with multiple internal injuries. The victim was transported to a local medical center where he died approximately 2 hours after the fall.

No fall prevention or fall arresting equipment was used by the victim at the time of the incident.

CAUSE OF DEATH

The medical examiner's report lists the cause of death as multiple blunt force injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Fall protection should always be provided when the potential for a serious or fatal fall from elevation exists.

Discussion: While traditional forms of fall protection, such as the safety belt/lanyard combination, may not be practical or applicable to all situations, an equally effective alternative should be utilized to eliminate the possibility of a fatal or serious fall. Some alternative methods which could have been used in this situation to protect the worker include: (1) safety nets rigged below the work area, or (2) a controlled descent device (retractor reel) secured to the crane rigging above the column. A cable from such a device running to a safety belt on the employee could have prevented this fall.

Recommendation #2: Safety considerations should be addressed during the planning phases of all construction projects. Potential safety problems, such as handling the oversize steel column, should be addressed in a pre-construction meeting between the contractor, architectural engineer, and the property owner.

Discussion: Often construction contracts contain generic requirements for the implementation of safety and health standards by referencing "compliance with all applicable local, state, and federal laws." Such broad-based requirements fail to address specific safety concerns which may be inherent to a project. If discussion of specific safety problems had been addressed prior to the start of the construction, provisions could have been made for the use of alternative safety measures while handling the oversize column, and the fatal fall could have been prevented.

Recommendation #3: Management should ensure that written safety policies and procedures exist and that they are enforced at the worksite.

Discussion: While company policy in this case required the use of a safety belt and lanyard at "all times when off the ground or off a properly protected floor," this policy was not enforced at the worksite. In this case the employee had a safety belt and lanyard at the worksite; however, when the use of this equipment was impractical, the employee was permitted to

work without fall protection of any type. A fatal fall was the result. When existing procedures or equipment are not sufficient for the job at hand, supervisors must take responsibility for implementing an alternative which provides at least the same level of protection as required by normal procedures. If some alternative form of fall protection had been utilized, this fatality would not have occurred.

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