



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research **NIOSH**

Caulking Mechanic Dies in Fall when Scaffold Fails

FACE 8929

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 15, 1989, a 33-year-old male caulking mechanic died when the scaffold upon which he was working failed, causing him to fall 60 feet to the ground.

CONTACTS/ACTIVITIES

State officials notified DSR of this fatality and requested technical assistance. On April 18, 1989, a DSR safety specialist and safety engineer discussed this case with state officials and emergency services personnel. The incident was reviewed with company officials and the incident site was visited and photographed.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The employer is a caulking contractor with 13 employees, including seven caulking mechanics. The company has been in existence for 52 years. The victim had been employed by the company for the past 16 years, working the last 12 years as a caulking mechanic. The company has no formal safety program. Employee safety training in recognition, identification and control of job hazards is provided through on-the-job training. The victim was serving as the foreman of a two-person crew at the time of the incident.

SYNOPSIS OF EVENTS

On the morning of the incident, the victim and one co-worker completed a 2-hour caulking job, then went to the site of a newly constructed 7-story building to continue a caulking job they had started several days earlier. The front and rear building exterior utilized a combination of precast concrete panels and plate glass, while the sides were entirely of plate

glass. They were caulking the precast concrete panels which were architecturally arranged from ground level to the sixth floor.

The caulking contractor provided a personnel lift on site; however, it did not reach above the fifth floor. In order to caulk the precast concrete panels at the sixth-floor level, the workmen would have to use a suspended scaffold.

The victim and co-worker arrived on the site at approximately 9:30 a.m. A window washing contractor was on site and had already rigged a powered 2-point suspended scaffold on the building. The scaffolding was located so that the caulking crew could caulk part of the sixth-floor level. The victim and a window washer decided that they would share the suspended scaffold while the two remaining co-workers, one caulker and one window washer, would share the personnel lift. With this arrangement, the caulking contractor's employees would not have to rig the scaffold they had brought to the jobsite.

The victim and the window washer began their work from the scaffold at the six-floor level. Although the victim had brought safety belts and lifelines to the site, neither group of workers used this personal protective equipment. They had completed work on a section of the sixth floor, and as they began their descent, the end of the scaffold where the victim stood suddenly dropped until the scaffold platform was in a vertical position. The victim, who was not tied off to an independent lifeline, fell approximately 60 feet from the scaffold to hard packed earth. The window washer managed to cling to the other end of the scaffold and a nearby ledge until the personnel manlift could be moved to the scene approximately 25 minutes after the fall.

The victim struck the building numerous times as he was falling. Workers in the area immediately telephoned the local Emergency Medical Service which arrived on the scene approximately 5 minutes after the incident. The victim, who was still conscious, was immediately transported to a nearby medical center where he died from massive internal injuries.

Although the victim had several years of experience using similar 2 point suspension scaffolds, he had not been trained to use this particular type. When the workers were ready to descend, the victim may not have

disengaged the parking brake before activating the climber in a downward direction. With this brake set, the scaffold would not lower. Instead, it would lift the cable hanging beneath the scaffold, causing the cable to accumulate slack in the climber housing mechanism. When the victim noticed his end of the scaffold was not descending, he possibly realized the brake was set and released it. When this occurred, the scaffold began to fall because of the accumulated slack line in the housing. It continued to fall because either the slackened line condition allowed the cable to get free of the climber mechanism, or the impact force of the falling scaffold was greater than the resisting force of the climber mechanism.

In addition to the parking brake, these climbing scaffold units are equipped with a centrifugal safety brake. This spring-loaded mechanism is designed to be in contact with the suspension cable and rotate as the cable passes by it. The brake is designed to activate when the centrifugal force of the rotating mechanism exceeds the force of the springs. Although this braking device was designed to activate in this type of circumstance, it malfunctioned because a spring had apparently come loose and jammed in the brake device. This allowed the victim's end of the scaffold to drop to a vertical position. The other climbing unit held the scaffold in suspension. (The problem with the centrifugal safety brake was discovered by the state OSHA compliance officer during inspection of the equipment immediately following the incident.)

CAUSE OF DEATH

The Medical Examiner gave the cause of death as a ruptured liver due to acute abdominal injuries received as a result of the fall.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Appropriate personal protective equipment should be worn whenever the potential for a serious fall exists.

Discussion: In this case, none of the four workers (two caulking mechanics and two window washers) were using any form of personal fall protection, despite the fact that the caulking contractor's employees had safety belts and lifelines in their truck. Although the scaffold climbing mechanism was equipped with an emergency braking device, the device malfunctioned allowing the end of the scaffold to lose its support causing the victim to fall 60 feet to the ground. Failure to use personal fall protection equipment contributed to the severity of this incident. If fall protection equipment had been used, this fatality may have been prevented.

Recommendation #2: Employees should receive training in the safe operation of all equipment prior to use.

Discussion: The victim had worked with suspension scaffolds for several years, but had no experience with the particular type of scaffold involved in this incident. Although most such scaffolds are similar in design, the controls are not standardized. The victim was not trained in the operation of this scaffold. This lack of training in operation of the scaffold involved in this incident may have contributed to this incident.

Recommendation #3: Equipment should be periodically inspected to ensure that all components are operational. This inspection should be accomplished by personnel thoroughly familiar with the equipment and the design capabilities.

Discussion: While the scaffold in this incident had reportedly been inspected the previous week, the inspector apparently did not detect the broken spring in the emergency brake. Failure to detect and correct this problem contributed to this incident.

Recommendation #4: Manufacturers of suspension scaffolds should review design of controls for these units to determine if practical design changes could be made which would reduce the chance of incidents like this in the future.

Discussion: A design modification which automatically disengaged the parking brake whenever the hoist mechanism is engaged to raise or lower the scaffold could prevent this type of incident from developing. In addition, a standardization of control design for these scaffolds among all manufacturers could reduce the chance of employee error in the operation of the scaffold.

Recommendation #5: The employer should design, develop, implement, and enforce a comprehensive safety program.

Discussion: Employers should ensure that employees are trained to recognize and avoid hazardous work conditions and that the work environment is safe. Employers should design, develop, implement, and enforce a comprehensive safety program to protect workers as required by OSHA Standard 1926.20. The company had no formal comprehensive safety program, and unsafe work practices had been tolerated. Although a relatively small company, the employer should immediately evaluate the tasks performed by workers; identify all potential hazards; and then design, develop, implement, and enforce a comprehensive safety program addressing these issues. Also, prior to starting any job, the employer should conduct a jobsite survey, identify all hazards, and implement appropriate control measures.

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