



The National Institute for Occupational Safety and Health (NIOSH)

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# Foreman and Painter Die in 48-Foot Fall When Scaffold Collapses

FACE 8907

## 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 November 15, 1988, a 53-year-old male foreman and a 28-year-old male painter died when the scaffold from which they were working collapsed, causing them to fall 48 feet to the ground below.

## CONTACTS/ACTIVITIES

State officials of the Occupational Safety and Health Program notified DSR of this fatality and requested technical assistance. On December 15, 1988, a DSR research industrial hygienist met with the state OSHA official who investigated the incident and representatives of various companies and local police and fire departments that were involved in the incident, and photographed the site.

## OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The employer is a painting company with 50 employees. The company consists of a painting division with 29 painters and a small construction division. Most of the company business involves painting buildings and other outdoor structures. The company's Hazard Communication Program consists of a brief verbal orientation to new employees concerning the potential hazards of various chemicals contained in paint. The company also has Material Safety Data Sheets (MSDS) available. However, the company has no written safety program, and did not have any safety meetings or training specifically addressing fall prevention or fall protection.

The foreman involved in this incident had a total of 20 years of experience as a painter, including 15 years with the company as a painter foreman. The other painter had 2 years of experience with the company as a painter.

It should be noted that two painters with the same company died in separate, previous work-related incidents. In 1987, a painter fell to his death from an aerial bucket, and in 1972, a painter suspended in a boatswain's chair came in contact with a power line and was electrocuted.

## SYNOPSIS OF EVENTS

The company was hired to paint the outside of several tanks at a petrochemical storage plant. The storage tanks are 48 feet high and 56 feet in diameter. Stairs that wind around the tanks provide access to the top. The top of the tanks are smooth and have a slight downward slope that extends from the center to the outside edge.

The two workers began painting the tanks from the bucket compartment of an aerial bucket truck without wearing any type of fall protection equipment. The painters used this painting method for several days and had completed one tank and were nearing completion of a second tank. However, gaining access to the unpainted side of the tank by using the bucket truck was not possible because other tanks were too close and some above-ground piping was in the way. Therefore, the foreman decided to finish painting the second tank using a two-point suspension scaffold.

The two workers arrived at the site in the morning on November 15, 1988 and set up the scaffold. The scaffold consisted of a worker platform of tubular steel, measuring 2 feet wide by 17 feet long, with two outside guardrails 24 inches and 48 inches above the platform. The platform was suspended by two wire suspension cables, each of which was 5/16th of an inch in diameter. The cables hung vertically from two tubular steel outriggers placed on top of the tank with the outboard ends extending 24 inches beyond the edge of the tank. The cables ran through an electrically-operated hoist on each end of the scaffold platform. This allowed the workers to raise or lower the scaffold platform to the desired height.

Although there were no eyewitnesses of the incident, physical and circumstantial evidence suggests the following:

1. The scaffold outriggers had been installed on top of the tank with only 200 pounds of counterweight. There were two 50-pound steel bars on each of the two outriggers. The outriggers had been set up to keep the suspension cables at a horizontal distance of 24 inches from the side of the tank. In order to maintain this horizontal distance, the scaffold manufacturer required a minimum of 600 pounds of counterweight for this type of scaffold (300 pounds on each outrigger) to counterbalance the work load.
2. The outriggers were not tied off to prevent them from slipping.
3. One end of a lifeline had been tied to a large vent pipe on the top center of the tank and the other end looped around the side of the scaffold guardrail.
4. Two buckets, each containing approximately 4 gallons of paint, were placed on the scaffold platform.
5. The two workers climbed onto the scaffold platform, raised the scaffold platform all the way to the top, got off on top of the tank, climbed down the tank stairs, and went to lunch.
6. Presumably, some time during the afternoon while the workers were on the scaffold platform, the outriggers slid off the top edge of the tank and the entire scaffold along with the two workers fell approximately 48 feet to a hard-packed gravel surface below.

The two workers were not discovered until 4:56 p.m. At that time a truck driver at the petrochemical storage plant was on his way to lock up the plant premises when he noticed the bodies and scaffold wreckage. The truck driver immediately notified the local fire department emergency medical service. Paramedics arrived at the scene in approximately 5 minutes and upon examining the victims, could not detect any signs of life. The county coroner subsequently arrived and pronounced the two workers dead at the scene.

## CAUSE OF DEATH

The medical examiner reported the cause of death for both workers as multiple blunt force trauma.

## RECOMMENDATIONS/DISCUSSION

**Recommendation #1: Employers should ensure that all employees required to work from elevated work platforms understand the potential danger of a fall, and the proper methods of erecting, placing, securing, and using scaffolds.**

Discussion: occupational Safety and Health Administration (OSHA) Safety and Health Standard 29 CFR 1926.451(g)(3) requires that the outriggers of this type of scaffold be securely anchored and that properly designed scaffolds, "... shall be constructed and erected in accordance with such design." For this type of scaffold and the way it was being used, the scaffold manufacturer recommends: (1) a minimum of 600 pounds of counterweight on the inboard end of the outrigger beams (300 pounds on each outrigger), and (2) that the outriggers also be securely tied back.

The fact that the workers only used 200 pounds of counterweight (100 pounds on each side) and that they did not tie back the outriggers indicates they did not fully understand the proper methods of erecting and securing this type of scaffold. The employer should ensure that all employees understand the danger of working on scaffolding. This includes the necessity of properly securing scaffold suspension points. Properly set up, the type of scaffold and anchoring system used in this incident would not have fallen.

**Recommendation #2: Where the potential for a fall from an elevation exists, employers should ensure that fall protection equipment is provided and used by workers.**

Discussion: Although a safety line had been tied to the top of the tank and the workers had safety belts with rope-grab devices at the site (and possibly on the scaffold) during the incident, they were not being worn by the workers. The use of a safety belt/lanyard combination is required by 29 CFR 1926.451(i)(8) for use on two-point suspension scaffolds. The use of the safety belt or body harness/lanyard with a rope grab device is appropriate for persons working from scaffolds at varying heights. Properly used, this type of fall protection would have prevented the workers in this incident from falling even when the scaffolding fell.

**Recommendation #3: Scaffolds should be erected under the supervision of persons who are competent in the use of scaffolds.**

Discussion: OSHA Standard 1926.451(a)(3) states: "No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons." The fact that the workers in this incident did not set up the scaffold according to the manufacturer's specifications points out that the workers did not understand the correct way to erect the scaffold under those circumstances. The scaffold erection should have been supervised by a worker experienced in erecting this type of scaffold.

**Recommendation #4: When workers are assigned hazardous tasks, or must work at hazardous workstations (such as elevated scaffolds), a standby person should be assigned to continually observe, give assistance, and ensure timely response in the event of an emergency. Additionally, close supervisory contact should be maintained periodically throughout the duration of the work.**

Discussion: On the day of the fatal incident, the two victims apparently worked alone, unobserved. They were not discovered until 4:56 p.m. when a truck driver was locking up the plant. No one was assigned to observe the work from the ground; additionally, the workers were apparently unsupervised from the time they installed the scaffold until the scaffold collapsed and they fell to the ground. Had the scaffold collapse and resultant fall been observed by someone standing by on the ground, help might have been summoned and emergency medical care administered promptly to the victims improving their chances of surviving the traumatic injuries they received. In any workplace situation which involves the potential for traumatic injury, a "buddy system" and close, periodic supervision are essential to protect the lives of exposed workers.

**Recommendation #5: The designers/owners of tanks of this type should design and install appropriate tank anchorage points for maintenance purposes.**

Discussion: Permanent structures of this type are known to require extensive maintenance when they are designed. It is essential that designers/owners of these facilities incorporate anchorage points on tank roofs to which workers can adequately secure scaffolds and lifelines. omission of designed anchor points causes workers to improvise anchors or not use them at all. This increases the possibility that a scaffold will be erected incorrectly. If scaffold anchor points had been available on the tank involved in this incident, the scaffold may not have been incorrectly erected, resulting in its failure. Also, if anchor points had been available, it's likely that the workers in this situation may have been tied off, thus preventing their fall when the scaffold fell.

**Recommendation #6: All employers should develop and implement a safety program designed to help workers recognize, understand, and control hazards.**

Discussion: Company management must ensure that employees are trained to recognize and avoid hazardous work conditions and that the work environment is safe. Employers should develop and implement a safety program to protect workers as required by OSHA Standard 1926.20. Additionally, OSHA Standard 1926.21(b)(2) requires employers to "... instruct each employee in the recognition and avoidance of unsafe conditions and the regulations applicable to his work environment to control or eliminate any hazards or other exposure to illness or injury." The company had no formal safety program, and there were no standard operating procedures for any of the tasks performed. Even after having two previous worker fatalities, the employer failed to provide written safety rules and training in safe work procedures. Although a relatively small company, the employer should immediately evaluate the tasks performed by workers, identify all potential hazards, and then develop and implement a safety program addressing these hazards. Prior to starting any job, the employer should conduct a job site survey, identify all hazards, and implement appropriate control measures.

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