



The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces
through safety and health research



Painter Dies in 25-Foot Fall from Tank Top onto Concrete Pad

FACE 8923

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 8, 1989, a 63-year-old male painter died when he fell 25 feet from the top of a tank onto a concrete pad.

CONTACTS/ACTIVITIES

Officials of the state Occupational Safety and Health Program notified DSR of this fatality and requested technical assistance. On February 14, 1989, DSR representatives interviewed a company official, conducted a site evaluation and photographed the incident site.

OVERVIEW OF EMPLOYER'S SAFETY PROGRAM

The company, a small painting contractor, employed five people at the time of the incident. The victim, who had owned the company for most of its 40-year existence, sold it to his son (the present owner) a few years prior to the incident.

The company has a designated safety officer and written safety procedures. The procedures require that safety measures be discussed before each job. The victim and his son had attended a union safety seminar for painting contractors 2 weeks prior to the incident.

SYNOPSIS OF EVENTS

The company had a contract to paint the exterior of several outdoor tanks for a food processing company. The tank involved in the incident was 25 feet high and 10 feet in diameter. A guardrail nearly circled the perimeter of the domed top of the tank. A 2-foot gap in the guardrail permitted worker access to the top. However, the tank did not have a permanent vertical

ladder for access. In order to reach the tank top, the painters climbed a permanent vertical ladder on an adjacent tank, then used small pipes, running between the two tanks, as a walkway to access the top of the tank to be painted. The distance between the two tanks was approximately 6 feet.

About a week before the incident, the victim and his son applied the primer coat to the exterior of the tank, using boatswain's chairs and spray guns. (A boatswain's chair is a seat supported by slings attached to a suspended rope, which is designed to accommodate one worker in a sitting position.) They decided not to use ladders because the small tank diameter made placement of the ladders difficult and unstable.

On the day of the incident, the victim was spraying on the finish coat of paint, a catalyzed urethane, using a boatswain's chair tied off to the guardrail atop the tank. He had reached the top of the tank to tie off the boatswain's chair by climbing the ladder on the adjacent tank, and crossing on small pipes that run between the two tanks. After finishing one section of the tank from the boatswain's chair, he climbed onto the adjacent tank and crossed the pipes once again. While moving the ropes that secured the boatswain's chair to the guardrail, he slipped and fell through the unguarded gap in the guardrail about 25 feet onto the concrete around the base of the tank.

Two steamfitters working in the area saw the victim fall. They said that the victim made no sound and made no attempt to grab onto the railing when he fell. A call was made within minutes for emergency rescue personnel. The victim was pronounced dead at the scene.

Following the incident the victim's son learned that his father had slipped and struck his chest on a truck bed a few days prior to the incident. At least two witnesses reported seeing the victim appear to "black out" for short periods of time in the 2 days before the incident. The son thinks that his father may have had a "black out" spell while moving the boatswain's chair rigging, since he apparently made no attempt to stop the fall.

CAUSE OF DEATH

The medical examiner's report stated that death was caused by internal injuries resulting from the fall.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: The employer needs to identify specific job hazards and take corrective action to ensure the safety of his employees.

Discussion: A review of potential hazards associated with working on the tank would have identified the hazards inherent in climbing onto and working from the top of the tank. This particular tank did not have a permanent ladder providing access to the tank top. Also, the guardrail did not extend around the entire perimeter of the tank. Finally, there was no toe board around the perimeter of the top of the tank to prevent someone from sliding beneath the guardrail. When reviewing how to paint this tank, the employer should have identified methods for protecting workers assigned tasks atop the tank. For example, a section of scaffolding with rails could have been placed between the two tanks to provide safe access to the tank being painted. Also, the opening in the guardrail could have been closed with rope or other material to protect the worker moving the boatswain's chair. To offset the absence of a toe board, the worker should have been tied off with safety belt and lanyard while moving around on top of the tank. The employer used a similar hazard identification process in arriving at the decision not to use ladders to paint the tank.

Recommendation #2: The employer should require that appropriate safety equipment be used, and check to see that it is being used properly.

Discussion: In 29 CFR 1926.28(a), employers are given the responsibility to require that employees wear personal protective equipment when exposed to hazards. While working from the boatswain's chair and while positioned on top of the tank, the worker should have been required to wear a safety belt and lanyard attached to an independent lifeline. Thus if the boatswain's chair or rigging had failed, or if the worker had slipped or lost his balance while on top of the tank, he would not have fallen to the concrete below.

Recommendation #3: Since there are a number of tanks in the area of the plant with no protection at the opening in the guardrail and no toe boards, the food processing company which owns the tanks needs to review and revise company safety practices and procedures for working on the outside storage tanks.

Discussion: A guardrail opening for access needs a means of closure such as chains or gate as per 29 CFR 1910.23 (a)(2), which states that “a platform shall be guarded by a standard railing ... with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.” When working on top of tanks without toe boards, workers should be required to tie off. Without a toe board, a worker could slip and fall under the railing. The owner also needs to determine how the tank top can be safely accessed. If the adjacent tank is to be used, a walkway should be installed between the tanks. If the tank will be accessed by lift or portable ladder, then use of the small pipes running between the tanks as means of access must be prohibited.

Recommendation #4: Designers of tanks of this type should incorporate anchorage points (for securing scaffolds and lifelines) and toe boards into the design of their products; owners of tanks of this type should consult with tank manufacturers to devise means of installing these safety features on existing tanks.

Discussion: Designers of permanent structures such as tanks of this type know that they will require regular maintenance. Designers and owners of such structures must design and install anchorage points on these structures (e.g. , on tops of tanks) to which workers can secure scaffolds and lifelines. Omission of designed anchor points causes the workers to improvise anchors or not use them at all.

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