

# **New Jersey Painter/De-Leader Dies in Fall from Suspended Scaffold in Water Tank in Massachusetts**

**Investigation: #95-MA-027-01**

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## **SUMMARY**

On August 3, 1995, a 45 year old male died, and a co-worker was injured, when the powered suspended platform on which they were working collapsed. The two men were hanging spray paint lines inside a 5.3 million gallon municipal water tank when the incident occurred. As the platform was descending the wall of the tank, one of two wire ropes suspending the platform broke. One end of the platform collapsed causing both men to fall to the sand covered bottom of the steel tank. Following prompt emergency response, the one worker was airlifted to a regional hospital where he survived serious injuries, while the victim was transported to a local hospital where he was officially pronounced dead less than forty-five minutes following the incident. The MA FACE Program concluded that to prevent similar future occurrences, employers should:

- c ensure that employees engaged in operations on suspended work platforms are provided fall protection equipment to be used at all times.**
- c ensure that wire rope used in suspended scaffolds is in proper condition before every shift.**
- c train all employees in the identification and control of hazards during the assembly, operation and use of powered suspended scaffolds.**

## **INTRODUCTION**

On August 4, 1995, the MA FACE Program learned through a newspaper clipping that a 45 year old painter died in a fall from collapsed scaffolding on the previous day. An investigation was immediately initiated. On August 17, 1995, the MA FACE Field Investigator traveled to the incident region where police department investigators and company representatives were interviewed and a site evaluation carried out. The police report, death certificate, municipal project advertisement to bid/request for proposal information, multiple news clippings and photographs were obtained during the course

of the investigation.

On October 16, 1995, the MA FACE Director attended a formal examination of the scaffold motor and hoist at a local police station where it was disassembled by the owner of the scaffold. Pictures were taken and the manufacturer's representative was interviewed.

The company was a New Jersey-based structural painting and deleading company in business for approximately twelve years. It employed eight workers, four of whom were working on the incident site. The crew foreman, who was also the company owner's brother, was the designated safety person on the jobsite. The company had written company safety rules and procedures in place, several of which dealt with the hazards associated with the incident.

The victim was a 45 year old male painter/deleader. He was employed by the company for approximately six years and was on the jobsite eight days at the time of the incident. His experience was gained primarily on the job and his training included personal protective equipment use, hazard communication and identification and use of job related machinery and equipment.

## **INVESTIGATION**

On August 3, 1995, at approximately 3:00 p.m., a crew of four painter/deleaders had finished sandblasting the interior of a municipal water tank for the day. The tank had a 5.3 million gallon capacity and was constructed of welded steel plate. It was ninety-six feet tall with an umbrella roof and had a diameter of approximately ninety-nine feet. The total surface area of the project was 75,000 square feet. The project contract included interior and exterior cleaning (deleading), inspection and coating.

The crew consisted of the project foreman, who was also the company owner's brother, and three workers. Two men worked inside of the tank and two on the outside. A coatings inspector, employed by an independent firm, was also on site at the time of the incident.

The suspension scaffold was a rented, air driven, Alpha 1000 Dual Hoist Powered Sky Climber suspended access work platform which was suitably guardrailed on all sides but the tank side. Nearly new 5/16" diameter wire rope, running through independent air pressurized hoists at opposite ends of the 25' x 3' aluminum platform, operated the system. The system was anchored through the roof. No fall protection equipment was installed. The workers inside the tank did have air-supplied respirators which they used while sandblasting. The scaffold had been assembled at the site by the work crew. From police photos taken at the incident scene, it does not appear that the secondary brake, or SkyLock, was attached to the motor.

According to the foreman, the crew had decided their workday was finished 10 - 20

minutes before the incident. The two workers performing the sandblasting operations inside of the tank had exited. The two workers then decided to hang the paint hoses for the next day's work and re-entered the tank. Although nobody witnessed them inside the tank, it is assumed that they boarded the powered suspension scaffolding and ascended the tank wall. They hung the hoses and started down the wall. Entrance and exit from the tank was through a door at the base.

The men, operating the hoist at opposite ends of the platform, were descending from the top and had reached a height of approximately thirty-five feet from the bottom when the incident occurred. The investigation revealed that at about this height, one worker's shirt had caught in the hoist opening through which the wire rope was traveling. Simultaneously, the wire rope broke inside the hoist mechanism at that end of the scaffold. The platform, now suspended by only one wire rope, dropped to a vertical position causing both men to fall onto the sand covered bottom of the steel plated tank.

Dealing with poor lighting and visibility due to the blasting sand and dust, emergency responders initiated CPR on the victim who lied motionless with obvious severe head trauma and internal injuries. The co-worker was minimally responsive and showed evidence of a compound fracture of his right thigh. The co-worker was airlifted to a regional hospital where he survived serious injuries, while the victim was transported to a local hospital where he was officially pronounced dead less than forty-five minutes following the incident.

On October 16, 1995 the hoist motor was disassembled at the local police station by the scaffold rental company who owned the equipment. The investigation of the scaffold motor revealed that a very small piece of cloth, from the surviving worker's jersey knit shirt, was caught in the tube entering the hoist mechanism. No shirt was found inside the housing itself. The tube was tapered and had very little clearance beyond the diameter of the wire rope. The wire rope had broken just beyond the entrance. No evidence of abrasion or wear on the gears, motor shaft or housing of the hoist were present. The remaining wire rope showed no evidence of excessive wear, though it is possible that there existed a kink in the wire rope at the point where it broke. The wire rope had not been inspected during the job, nor were any records kept of the condition of the rope.

## **CAUSE OF DEATH**

The medical examiner listed the cause of death as craniocerebral trauma.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1: Employers should ensure that employees engaged in operations on suspended work platforms are provided fall protection equipment to be used at all times.**

**Discussion:** In accordance with U. S. Department of Labor - OSHA Standards, persons working on suspended scaffolds must be provided with a personal fall arrest system. The purpose of these systems are to ensure that workers do not fall should the scaffold system fail at any point. A personal fall arrest system consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline or combination of these. The vertical lifelines should be anchored independently of the scaffold and protected from any sharp edges. Each person should use a separate lifeline.

**Recommendation #2: Employers should ensure that wire rope used in suspended scaffolds is in proper condition before every shift**

**Discussion:** Wire rope used in suspended scaffolds is subjected to wear and tear every day, particularly in high-speed powered scaffolds traveling over long distances in the course of a day. Before every shift, the rope should be inspected for kinks, bird caging, splits or other damage by a person trained and competent in identifying potential hazards. This person should also have the authority to stop a job and replace the rope before work continues. The inspection should be documented in a log book.

Wire rope should be inspected for:

- c physical damage that impairs function or strength
- c kinks that impair tracking or wrapping around drums or sheaves
- c broken wires
- c abrasion, corrosion, scrubbing, flattening or peening
- c heat damage
- c evidence that the secondary brake has been activated during an overspeed condition and has engaged the suspension rope.

In this incident, a shirt was caught in the tube where the rope enters the hoist. The shirt was not drawn into the mechanism of the hoist. The wire rope broke almost immediately under the strain. While there is no evidence that the remaining wire rope was damaged, it remains a possibility that the rope was already weakened, or kinked, at the breaking point.

**Recommendation #3: Employers should train all employees in the identification and control of hazards during the assembly, operation and use of powered suspended scaffolds.**

**The assembly, operation and use of a powered suspension scaffold is complicated. Training should be provided to all employees. This training should include recognizing the hazards associated with the type of scaffold being used and understanding the procedures to control those hazards.**

**Instruction should be provided on the proper use of the scaffold, including maximum loads and how work materials should be handled on the scaffold. Specialized training should be provided to those responsible for assembly and disassembly of the scaffold and fall protection system. All training should be conducted by a competent person, who is capable of identifying hazards, and who has authorization to take prompt corrective measures to eliminate them. This person should also oversee the proper assembly of the suspended scaffold, including assuring the proper performance of all safety devices on the scaffold.**

**In this case, it does not appear that the secondary brake was properly assembled as part of the scaffold. This brake is necessary to protect the scaffold from dropping when the rope runs through the sheaves of the hoist too quickly. Personal fall arrest systems are also an integral part of scaffold assembly and should have been included before the scaffold was used.**

## **REFERENCES**

Office of the Federal Register: Code of Federal Regulations, 29 CFR 1926. Use of fall protection: 1926.451(g)(1)(ii) also 1926.502 (d); Training for using scaffold: 1926.454 and 1926.21(b)(2); secondary brake: 1926.451(d)(16); wire rope inspection: 1926.451(d)(10)

Construction Safety Association of Ontario, Suspended Access Equipment, November 1991.

ANSI A10.8-1988, Scaffolding - safety requirements