

TO: Director, National Institute for Occupational Safety and Health

FROM: Iowa FACE Program

SUBJECT: Construction worker falls to his death while repairing elevator-- Iowa.

SUMMARY:

A 43 year old male construction worker with an out-of-state elevator repair company was one of two men repairing a commercial elevator damaged from an explosion in the fall of 1994. He was working inside the "star silo" at an elevation of 110 feet, drilling holes into the concrete wall of the silo and securing re-bar in preparation for a concrete patch. The men were using a wooden triangular scaffold suspended by 3 electric cable-climbers. The victim was standing outside the handrail, on the ends of 2x12s, not wearing a harness and lanyard, although these items were available at the job site. One corner of the scaffold suddenly shifted down two or more feet. The victim lost his balance and fell to the concrete floor below. He was killed instantly from multiple injuries.

RECOMMENDATIONS following our investigation were as follows:

- 1. *All suspended scaffold workers should wear fall protective equipment as required by OSHA regulations (29 CFR 1926.501) and work within the handrail perimeter of suspended scaffolds.*
- 2. *Employers should develop, implement and enforce a comprehensive safety program that includes regular training in hazard recognition, and compliance with proper fall protective equipment.*
- 3. *Suspension scaffolds and related cable climber equipment must be properly constructed and inspected according to guidelines in 29 CFR 1926.451 (i).*

INTRODUCTION

On March 24, 1995 a construction worker for an out-of-state repair company died after falling from a scaffold while repairing the sidewall of an elevator. On May 4, 1995 the Iowa FACE program was notified of the incident from the Iowa Medical Examiner's office and began an investigation. Sources of information were the medical examiner's report (with photographs), the county sheriff's report (with photographs), the local newspaper, and telephone interviews with the elevator manager and the out-of-state elevator repair company. A site visit was conducted on May 12, 1995.

The employer was a construction company very experienced in the repair and painting of commercial elevators, having been in business for 39 years. This company has a seasonal maximum of 50-60 employees and the victim had been employed on a seasonal basis for over

three years. This was the company's first occupational fatality. There were three employees on-site at the time of the accident --two men on the scaffold, and one foreman on the ground. There was a written safety policy in effect for this company, however most safety training was verbal and "hands-on" by experienced foremen. All three men present were experienced in this type of work and this was considered a routine repair job.

INVESTIGATION

The elevator had had an explosion during the fall of 1994 and a repair company from out-of-state was contracted to make repairs. The workers had been on-site for six weeks prior to the accident and were close to completion of their work. At that time they were repairing the interior sidewall of what is called the "star bin", the interior area between the four concrete main cylinders of the elevator. They were drilling holes into the edge of the concrete defect and installing re-bar prior to applying a concrete patch to the sidewall.

The two men were working from a 3-point suspension scaffold made from 3 sets of 2x12 lumber suspended with an electric cable climber at each corner. The surface of the triangular wooden frame was covered with plywood and there was a triangular 2x4 wooden handrail between each of the cable climbers. A co-worker stated that the victim was standing outside this railing, on the ends of the 2 x12s to gain easier access to the sidewall of the elevator and presumably to get better leverage with his drill. The foreman below had requested that both men wear their harness and lanyards, however neither of the men were wearing any fall protective equipment at the time of the accident.

As the two men were moving the scaffold at approximately 8:00 A.M., one cable climber slipped sufficiently to let one corner of the scaffold drop approximately 2 ft.. Normally the cable climber shifts only a few inches before it is stopped by a brake. The corner that dropped was where the victim was standing, outside the handrail. The victim lost his balance and fell approximately 110 ft. hitting a concrete exit chute below. He fell through a hole (18" x 24") in the concrete subfloor of the "star bin" and landed on the concrete floor at ground level. He suffered massive head and internal injuries and died instantly. A broken industrial hammer drill, boxes of power nails and charges, a thermos, power cords, etc. also fell, indicating that the platform shifted significantly. The other worker remained on the scaffold and was not injured.

CAUSE OF DEATH

The Iowa State Medical Examiner determined the cause of death as "*multiple injuries due to an accidental fall*". The autopsy revealed multiple deceleration-type internal injuries, multiple fractures, and a positive urine test for cannabinoids. This test is not specific for time and cannot be considered as a factor in this accident.

RECOMMENDATIONS / DISCUSSION

Recommendation #1 All scaffold workers must wear fall protective equipment as required by

OSHA regulations (29 CFR 1926.501) and work within the handrail perimeter of suspended scaffolds.

Discussion: Fall protective equipment could have saved the victim's life. This type of suspension scaffold requires both guardrails and the use of a harness and lanyard. Neither man working on this scaffold was wearing fall protective equipment, even though these items were directly available at the job site.

Recommendation #2 *Employers should develop, implement and enforce a comprehensive safety program that includes regular training in hazard recognition, and compliance with proper fall protective equipment..*

Discussion: The foreman for this repair company was experienced with suspension scaffolds, knowing safety belts, harnesses, and lanyards were required for fall protection. Safety training was conducted with employees and they were aware of the hazards of their job. However requests for these two men to use fall protective equipment were ignored. The victim was standing and working outside the wooden guardrail, supported only by the ends of two 2 x 12s, trying to get closer to the sidewall of the elevator. While he may have increased his drilling leverage, he increased his risk as well. Employers should consistently enforce compliance with proper use of fall protective equipment and guardrails.

Recommendation #3 *Suspension scaffolds and related cable climber equipment must be properly constructed and inspected according to guidelines in 29 CFR 1926.451 (i).*

Discussion: The triangular configuration of suspension scaffold in this case appears difficult for two men to adjust safely. A smaller, 2-point suspension scaffold would be a safer choice. The type of cable climber used was operated by an industrial electric drill attached to a drum which rides up and down a stationary cable. It contains a hand brake which is designed to prevent sudden downward movements of the scaffold. This piece of equipment requires regular maintenance to work properly. It is unknown when this particular climber was last serviced, or which component of the unit failed. One cable climber did fail, allowing sudden movement of the scaffold corner down two or more feet causing the worker to lose his balance. One report stated the scaffold corner fell to a 45 degree angle, which would require much more than a two-foot drop.

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