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PUBLIC HEALTH SERVICE/CDC/NIOSH/DSR
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TO: **Director, National Institute for Occupational Safety and Health**

FROM: **Division of Safety Research, NIOSH**

SUBJECT: **Supervisor Dies As A Result Of Injuries Sustained In Fall With Powered Vertical Lift Aerial Platform--Virginia**

SUMMARY

On May 7, 1996, a 37-year-old male supervisor (the victim) died as a result of injuries he sustained when the powered vertical lift aerial platform he was operating tipped over, and he and the machine fell 15 feet to the floor of a department store. The victim and a co-worker had been assigned to string electrical wiring above the suspended ceiling of a newly constructed department store. The victim mounted a vertical lift aerial platform and raised the platform approximately 15 feet above the floor level. He then drove the machine in reverse toward the working area while the co-worker performed other tasks at floor level. En route to the working area, one of the four wheels of the vertical lift aerial platform dropped into an unguarded hole in the department store's floor. The machine tipped over and fell to the floor along with the victim. The victim's head struck the concrete floor upon impact. An electrician who was in the area saw the aerial platform fall to the ground and the victim strike his head. He immediately called 911 for assistance. The emergency medical service (EMS) arrived within 6 minutes and stabilized and transported the victim to a local hospital where he died about 8 hours later. NIOSH investigators concluded that, to prevent similar occurrences, employers should:

- *ensure all floor holes are guarded and/or covered*
- *adhere to the safety practices for operating self-propelled elevating work platforms per the ANSI/SIA safety standards*
- *review and revise, where applicable, the existing written safety program.*

Additionally, rental agencies should:

- *explain safety procedures regarding vertical lift aerial platforms.*

INTRODUCTION

On May 7, 1996, a 37-year-old male supervisor (the victim) died after the powered vertical lift aerial platform he was operating tipped over and he and the machine fell to the floor. On May 13, 1996, officials of the Virginia Occupational Safety and Health Administration (VAOSHA) notified the Division of Safety Research (DSR) of the fatality and requested technical assistance. On May 30, 1996, a DSR safety specialist met with the VAOSHA compliance officer assigned to the case. The VAOSHA file was reviewed and photographs of the incident site immediately after the incident occurred were also reviewed.

The employer in this incident was a commercial and industrial heating, air conditioning, refrigeration, and energy management company. The company employed 33 workers at various work sites around the country, two of whom were working at the incident site. The company had a written general safety program, but no specific written procedures for powered vertical aerial lift platforms. Also, the company retained the services of a safety consultant on an as-needed basis. The victim was a supervisor with 4 years' experience with this company. This was the first fatality experienced by the company.

INVESTIGATION

The company had been subcontracted to install air conditioning units and related electrical wiring at a newly constructed 200,000-square-foot department store. On the day of the incident, the victim and a co-worker started work at about 8 a.m. The victim was going to string electrical wiring above the grid work for the suspended ceiling panels while the co-worker performed various labor duties.

Access to the ceiling was provided by a powered vertical lift aerial platform. The platform was 25 inches wide by 8 feet 6 ½ inches long and equipped with 30-inch-high guardrails around the platform perimeter. The platform could be extended 15 feet above floor level and was hydraulically operated. The machine weighed 3,800 pounds, was battery/electric propelled, and equipped with four 16-inch-diameter by 4-inch-wide solid rubber tires (Figure). The machine was delivered on the morning of the incident by an equipment rental company. The delivery person reportedly asked the victim if he was familiar with the use of the machine and the victim stated he was experienced in operating the machine.

At about 10:15 a.m. the victim mounted the machine, accessed the control panel and raised the platform about 15 feet above floor level. He then positioned the control lever in the reverse position and started traveling. As the machine was traveling in reverse, one of the four wheels dropped into a 27-inch-square by 14-inch-deep unguarded hole in the floor of the department store (the hole would later be used to pass through refrigeration cables). With the platform raised to its highest position, the center of gravity was changed dramatically, and when the wheel dropped into the floor hole, the machine tipped over. As the machine fell to the floor the victim was thrown from the platform and his head struck the concrete floor. The co-worker, who was located some distance away from the incident, did not witness the event, but an electrician who worked for another contractor was in the area and saw the aerial platform fall to the ground and the victim strike his head. He immediately called 911 for assistance. The EMS arrived within 6 minutes, stabilized, and transported the victim to a local hospital where he died about 8 hours later.

CAUSE OF DEATH

The medical examiner's report stated the cause of death as blunt-force trauma to the head.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Contractors at construction sites should coordinate their safety responsibilities and ensure all floor holes are guarded and/or covered.

Discussion: In this incident the victim drove the powered vertical lift aerial platform into an unguarded floor hole, resulting in his eventual death. All floor holes should be guarded and/or covered such that workers cannot fall and equipment cannot be driven into them. The general and subcontractors did not coordinate their safety responsibilities and the floor hole remained unguarded and uncovered. At construction sites where more than one contractor is involved, the need for safety coordination and designated safety responsibilities is paramount to the safety and welfare of all employees.

Recommendation #2: Employers should adhere to the safety requirements for operating self-propelled elevating work platforms per the ANSI/SIA safety standards.

Discussion: The victim boarded the aerial lift platform, raised the platform to about 15 feet above the floor, and drove the machine toward the working area. En route to the work area one of the four wheels dropped into a floor hole and the machine

tipped over. The machine, along with its operator the victim, fell to the floor and the victim struck his head on the floor and eventually died. ANSI/SIA A92.6-1990 8.6 (2), 8.7, and 8.10.15 (1),(2) states that, (1) the operator shall have read and understood the manufacturer's operating instructions and user's safety rules, or been trained by a qualified person on the contents of the manufacturer's operating instructions and user's safety rules; (2) the operator shall check the area in which the aerial platform is to be used for possible hazards such as, but not limited to: (a) drop-offs or holes, (b) bumps and floor obstructions, (c) debris, (d) overhead obstructions and high voltage conductors, (e) inadequate surface and support to withstand all load forces imposed by the aerial platform in all operating configurations, (f) wind and weather conditions and g) other possible unsafe conditions; and (3) before and during driving while the platform is elevated, the operator shall: (a) maintain a clear view of the path of travel, and (b) maintain a safe distance from obstacles, debris, drop-offs, holes, depressions, ramps, and other hazards to ensure safe elevated travel.

Recommendation #3: Employers should review and revise, where applicable, the existing written safety program.

Discussion: Although the employer had a written safety program, the program did not address safety procedures regarding powered vertical lift aerial platforms. The implementation and enforcement of a written comprehensive safety program should reduce and/or eliminate worker exposures to hazardous situations. The safety program should include, but not be limited to, the recognition and avoidance of all hazards, and the strict use of equipment manufacturer's operating instructions. If either one of the following two operating instructions would have been followed, the incident may have been prevented: (1) whenever possible, travel only in the full-down, stowed position for maximum stability, and (2) always check to be sure the route is clear of persons and obstructions.

Recommendation #4: Rental company personnel should explain safety procedures and provide training on the proper use of vertical lift aerial platforms.

Discussion: Although the victim acknowledged he was familiar with the operation of the machine, the rental company representative, at a minimum, should have communicated necessary safety information contained in the operating and maintenance manuals. Additionally, ANSI/SIA A92.6-1990 5.6.1 states that "Manufacturer's operating instruction and required training on the proper use and operation of the aerial platform shall be provided upon each delivery by sale, lease, or rental." In this case if safety instructions and operator training had been performed, the incident may have been prevented.

REFERENCES

ANSI/SIA A92.6-1990 - American National Standard for Self-Propelled Elevating Work Platforms, PP, 15, 20-21. American National Standards Institute, New York, N.Y. 10018.

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Fatality Assessment and Control Evaluation (FACE) Project

The National Institute for Occupational Safety and Health (NIOSH), Division of Safety Research (DSR), performs Fatality Assessment and Control Evaluation (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.

States participating in this study: North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia.

Additional information regarding this report is available from:

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