

Self-Employed Electrician Dies While Driving Aerial Lift in Parking Garage

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SUMMARY

On October 3, 1998, a 39 year old male self-employed electrician died of injuries sustained when he struck his head on a steel overhead beam while driving an aerial lift truck. The incident occurred in a privately-owned parking garage where the victim had been contracted to change the ballasts in light fixtures located on the top floor (roof) of the garage. The victim was transporting the aerial lift truck down the ramp of the garage when the incident occurred. The victim was riding on the outside of the lift and ducking under the beams when his head struck a beam. A garage patron leaving the garage found the victim and immediately went for help. Police, fire and emergency medical services personnel soon arrived at the scene. The victim was transported to a nearby hospital emergency room where he was admitted and died two days later. The MA FACE Program concluded that to prevent similar future occurrences:

Contractors and tradespeople should:

- **never ride on the outside of an aerial lift truck**
- **perform a hazard analysis of each job, bring the proper personal protective equipment, in this case, a hard-hat, to the job site and wear it**

In addition:

- **Manufacturers should consider including specific instructions for the operation of special use aerial lift trucks.**

INTRODUCTION

On October 3, 1998, the MA FACE Program was notified by a local police department through the 24-hour occupational fatality hotline that a 39 year old male self-employed electrician had been hospitalized with a critical head injury sustained when he struck his head on a steel overhead beam that afternoon. On the following Monday, October 5, the FACE Director contacted the police department for more information and an investigation was initiated. The area OSHA office was contacted, but they were not investigating the incident since the victim was self-employed. The property management company where the incident occurred informed the FACE investigator that the lift was rented from a local rental company.

On October 6, the MA FACE Program Director, accompanied by a service representative from the rental company which owned the aerial lift truck, traveled to the local police station where the control box from the lift truck was being held. They then traveled to the incident site where a review of the scene and an examination of the lift truck took place. The project manager for the parking garage and building complex, who had accompanied the victim to the garage on the day of the incident, was interviewed. The police report, death certificate, witness interviews, multiple photographs and lift truck manuals were obtained during the course of the investigation.

The victim was a self-employed licensed electrician in business for over eight years at the time of the incident. The incident site was a privately-owned parking garage which was a part of a larger residential/office complex with several buildings. The victim had been contracted for much of the electrical work at the complex for the past eight years. Prior to that, he had also worked on the crew which had constructed the complex. He had no employees in his company.

INVESTIGATION

A self-employed electrician had performed electrical work for a residential/office complex periodically for over 8 years. His most recent job assignment was to replace the ballasts in the pole lights on the open top floor (roof level) of the parking garage. The job required the use of an aerial lift that could access lighting fixtures 30 feet from the ground, but could also fit under the low overhead beams within the garage. The electrician contacted a rental agency who was able to provide the lift and deliver it to the site. The work was scheduled to be performed on a Saturday when there would be less public activity at the garage. Another crew would also be working that day on concrete surface repairs on the same top floor, so that floor would be closed to vehicles for the day.

The rental agency met the electrician and two employees from the property management company at the site on Friday afternoon about 3:30 pm. The delivery person offered instruction on operating the aerial lift truck to the electrician, who declined and signed off that he knew how to operate the lift. This particular aerial lift featured fold-down guardrails which reduced the total height of the lift to 76 inches from a normal stowed height of 95 inches. This lower overall height was necessary for transporting the lift through the garage.

The property management personnel assisted the electrician in bringing the lift to the roof. There was heavy traffic in the garage at this time of day which created obstacles for transporting the lift. The men hung the controller on the end of the lift and operated it from there, walking alongside it up to the roof. They left the lift there to be used the next day. The electrician unplugged the control box and took it home with him for security and safety reasons.

On Saturday morning the electrician arrived about 7 a.m. and met the property manager. He realized that he had left the control box home and drove back to get it. He came back and started the job around 9 a.m. He proceeded to use the aerial lift and replace the ballasts in the lamps on the top deck of the garage. He was not wearing a hard-hat nor any other personal protective equipment. Another crew repairing the concrete was also working on that level. After completing the job at approximately 1:30 p.m., he lowered the lift and starting driving it down to the first floor. The top deck was the fourth floor of the garage.

A security camera recorded the electrician bringing the aerial lift down through the garage. This video was viewed by the property manager who had been with the victim on the day of the incident and who was interviewed as part of this investigation. The electrician was riding on the outside of the aerial lift. He was standing on the cover over the right front wheel. The control box was hung on the toeboard of the platform, at approximately elbow height. He had wrapped his left arm through the platform rail and was driving the joystick with his right hand. He had stuck a pair of pliers into the handle in order to maintain the safety switch in the ON position. The controller was set to travel at FAST speed which is a maximum of 2.9 mph.

The top deck was open with no overhead obstructions. Reaching the third floor there were overhead beams every 16 or 24 feet apart. As he reached each overhead steel beam he would duck under it. He continued this procedure traveling twice the length of the garage (approximately 225 feet) on the third floor. He then came around the corner to the flat portion of the second floor. He ducked under the first beam, but struck his head on the second beam. Evidence indicates that his head also struck the top rail of the lift truck. The blow caused him to fall from the equipment. The controller also fell and the pliers apparently fell out of the handle. The equipment immediately stopped. The security camera did not cover this portion of the garage.

The victim was found by a garage patron who notified the garage security. Emergency medical services were called immediately. It was estimated that the victim had been unconscious in the garage for 20 minutes before he was found. The fire department responded and attended to the victim for a few minutes before transporting him by ambulance to a local hospital emergency room. He was admitted to the hospital where he died two days later as a result of his injuries.

The investigation revealed that the beam that the electrician struck was 16 feet from the first beam on that floor. At this point there was 80.5 inches clearance from the concrete floor of the garage to the beam. The bumper-like surface on which the victim stood was 23 3/4 inches from the ground. The victim was approximately 5'8" tall. Therefore he had to duck over 11 inches to clear the beams.

The garage was approximately 225 feet long and divided lengthwise into two sections. Cars would park (front end in) along the outer and inner walls. One section on each level was flat and the other section served as a ramp. The exit/entrance path was between the rows of parked cars on either side. There was no parking at either end of the garage which was used for turning onto the next level. The exit/entrance path was approximately 26 feet wide between the vertical steel beams that supported the overhead steel beams. The overhead steel beams in this center section were 6" by 20" I- beams. The clearance from the concrete floor to these overhead beams varied from at least 78" to almost 81" through the garage.

The aerial lift was a scissors-type lift with a platform working area of 44.5 by 112.5 inches. The platform could be extended another 36 inches. As mentioned previously, this particular aerial lift had guardrails that could be folded down. In normal use, the rails would be 42 inches high when standing on the platform. Folded down the rails were 23 inches high. This made it virtually impossible to drive the lift from the platform, particularly over any distance. The fold-down rails enabled the lift to fit through a normal height doorway, which is 78". The lift would still be too wide

(48 inches at the wheelbase) for a home or office door, but worked well for malls and other locations with double doors.

The examination of the aerial lift revealed no problems with operation. The control box had a joystick for directional movement, as well as controls for raising and lowering the aerial platform. Under normal use, the control box would be hung on the inside of the platform rail so that the lift could be driven from there. The control box could be hung on the outside or carried by hand to drive the lift while standing on the ground. The control box also had an enable switch, which was a safety switch embedded in the handle of the control box. This switch had to be engaged in order for any of the switches on the control box to function. This required the use of both hands on the control box. The purpose of this switch was to prevent the inadvertent operation of any aerial lift function or motion.

The electrician had rented lifts like this many times in the past and was very familiar with their operation. The rental company provided several documents with the equipment to be used by operators to familiarize themselves with the equipment, as well as offering on-site training if requested. The documents included the manufacturers' operator's manual, a generic safety manual on aerial platforms by the Equipment Manufacturers Institute, and a "Manual of Responsibilities" which contains the relevant portions of the ANSI standard and is published by the Scaffold Industry Association.

Most aerial lifts are driven between work areas by standing on the platform with the lift lowered to a specified height. This particular aerial lift is different from most in that the guardrails fold down and it is intended to be used in areas with little or no overhead clearance while traveling. All of these documents imply that the lift should always be driven from inside the platform, which would not be possible in this situation. There are no special instructions for transporting the lift under these circumstances. The manufacturers manual states that "Aerial lifts with fold down guard rails should only be driven with the guard rail in the lowered position to allow entry through a doorway with low vertical clearance. Once entry has been gained, erect guard rails before continuing to operate any function." No advice is given regarding driving the lift while walking beside it or not to ride on the outside of the lift.

CAUSE OF DEATH

The medical examiner listed the cause of death as blunt head trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Contractors and tradespeople should never ride on the outside of an aerial lift truck.

Discussion: Riding on the outside of the aerial lift truck, or on any equipment not designed for that purpose is dangerous. In this case, riding on the "bumper" caused the electrician to be taller than the folded down lift truck. Therefore he had to duck under the low clearance beams. He was fully aware of this problem since he had specifically rented a lower aerial lift truck to clear the beams. The aerial lift truck is not designed nor intended to be driven in this manner. The footing

is insecure, there is no place to hold on and it was not possible to operate the controller with two hands as was required. The electrician therefore had to override the safety mechanism on the controller to do this.

The proper way to transport the equipment in these circumstances is to walk beside it holding the controller with two hands. If it is necessary to watch all sides of the truck while moving it, then it may be necessary to seek help from another person on the site.

Recommendation #2: Contractors should perform a hazard analysis of each job, bring the proper personal protective equipment, in this case, a hard-hat, to the job site and wear it.

Discussion: The electrician in this case did perform a site survey in order to determine what equipment he would need to do the job. Contractors should use this opportunity to also analyze the site for safety and health hazards. It is then possible to bring the right personal protective equipment to the site or implement other controls in order to work safely. If training is needed to identify safety and health hazards, then contractors should make use of resources provided by OSHA, the National Safety Council and their local affiliates, vocational-technical schools or other training institutions to learn this skill. Identifying and controlling the hazards of the trade is as much of a skill as learning the trade itself. Preventing injuries for self-employed contractors saves time, money and lives.

In this case, had the electrician identified the hazard to himself, he may not have ridden on the outside of the aerial lift truck (see Recommendation #1) and/or he may have brought and worn a hard hat to protect himself. We do not know if wearing a hard-hat would have saved his life. However, wearing the hard hat may have made it more difficult to ride on the lift truck and discouraged him from doing so.

Recommendation #3: Manufacturers should consider including specific instructions for the operation of special use aerial lift trucks.

Discussion: This aerial lift truck was specially designed to be capable of entering and exiting low overhead clearance areas by folding down the guardrails. Folding the guardrails decreased the height of the platform area, from which the truck is normally operated, to only 23 inches. The operation manual states that the truck should be driven only from this platform. Driving the lift from inside the folded-down guardrails would not be practical over a longer distance than through a doorway.

The electrician was using this truck for a purpose not anticipated by the standard operating manual. He found himself in a circumstance where it was impossible to ride on the platform. He may (or may not) have felt that he needed to be on the vehicle in order to maneuver it correctly, and, in any case, chose to ride on the outside of the equipment. When bringing the lift up to the roof, he did walk beside it, accompanied by others who could assist in watching the side clearances.

It may be necessary for equipment manufacturers to include special instructions for these specially designed lift trucks to educate users to their particular hazards, perhaps including these instructions right on the equipment with the other warning signs. This would include instructing users of the

equipment to transport them from the ground when the guardrails are folded down, as well as not to ride on the outside of the equipment.

REFERENCES

American National Standards Institute for Self-Propelled Elevating Work Platforms, ANSI/SIA A92.6-1990

Code of Federal Regulations, Labor 29 Parts 1926.453 Aerial lifts.

Equipment Manufacturers Institute, Aerial platform safety manual for operators and mechanics, Chicago, Illinois, Revised 1995.