Case: 92-MA-010
Release Date: August 25, 1992

Elevator Service/Repair Helper Electrocuted in Massachusetts

SUMMARY

A 35 year old male elevator service/repair helper (victim) was electrocuted while installing a new electrical component on a commercial elevator car. During the course of this installation, the victim who was working unobserved, came into contact with an energized 110 volt electrical circuit supplying power to an operational single socket porcelain lighting fixture located on top of the elevator car. The victim was attempting connection of the component to the live branch circuit when he was jolted by the 110 volt current. Immediately shaking off the effect of the electrical charge, the victim resumed his work and collapsed approximately 50 - 60 minutes later while standing beside a co-worker inside the elevator car. The co-worker caught the victim as he pitched forward in the elevator car and immediately summoned facility medical personnel that included a company based physician. The victim was then transported to the local hospital where he was pronounced dead 1 hour and 40 minutes later.

The Massachusetts FACE Investigator concluded that to prevent similar occurrences in the future, employers should:

- **Provide assurance that electrical systems are de-energized and tested to verify that they are de-energized prior to any work being performed on them.**
- **Ensure proper lock out and tag procedures that are followed at all times.**
- **Develop safety programs that provide a system of inspection and evaluation to ensure worker compliance with safe work procedures and ensure program effectiveness.**
- **Consider use of battery powered electrical lighting systems when performing electricity related maintenance.**
- **Implement a medical surveillance program that mandates employees suffering work related mishaps seek immediate medical attention regardless of severity.**

INTRODUCTION

On April 27, 1992, the Massachusetts FACE Field Investigator was notified by the FACE Project Principal Investigator that a routine screening of death certificates yielded a targeted electrocution occurring on March 26, 1992. An immediate investigation into the incident was then initiated.

On April 30, 1992, the MA FACE Investigator conducted interviews with the victim's employer and the jobsite owner's legal representative. Regional U.S. Department of Labor OSHA facility compliance

personnel also provided invaluable assistance throughout the investigation, as well. The Massachusetts Department of Labor and Industries report, the death certificate, and the medical examiner's report were obtained during the course of the investigation, as was the opportunity to fully review the U.S. Department of Labor OSHA file relative to this incident.

The employer was a national elevator/escalator sales and service company employing 1000+ and in business for over 100 years. It employed approximately 80 persons in Massachusetts, 15 in the service division.

The company employed designated safety personnel and maintained comprehensive written safety rules and procedures and a written safety program. Safety rules, procedures and program included electrical safety. Most recent safety training meeting was conducted 1 week prior to this incident with victim in attendance.

The victim was a 35 year old male, employed by the company on two separate occasions as a service/repair assistant for a total of approximately nine years.

INVESTIGATION

On the day of the fatality, March 26, 1992, the employer was under contract to install an electrical component designed to more efficiently operate the doors of an existing elevator at a large manufacturing plant.

In the hours immediately prior to the incident, the elevator car had been de-energized and positioned in a manner enabling access to either the elevator car or it's rooftop. The only remaining live electrical circuit was one that supplied power to a single socket porcelain lighting fixture on top of the elevator car that would also soon energize the new electrical component. Apparently, this circuit had not been de-energized due to difficulty encountered in determining its source.

Since the circuit disconnect could not readily be found and it was conveniently supplying jobsite illumination, the men proceeded to make the connection on the live line. The victim and his co-worker were actively engaged in the installation of this component and not in visual contact with one another. The victim was on top of the elevator car when he apparently made direct contact with the 110 volt electrical circuit.

Suffering only a momentary electrical charge, the victim immediately resumed his duties without thought or concern. Approximately 50 - 60 minutes following the electrical charge and while the victim was standing beside his co-worker inside the elevator car, the victim pitched forward and collapsed to the floor. The co-worker immediately summoned on-site medical personnel including a company based physician who performed an emergency tracheotomy prior to transport of the victim to the regional hospital. The victim was officially pronounced dead 1 hour and 40 minutes later.

Because the victim had survived the momentary electrical charge for 50 - 60 minutes, this incident had initially been reported as a probable heart attack. The victim's co-worker had noticed the victim not looking very well, not feeling very well, and not eating lunch regularly for several days prior to the incident. It was not until after the autopsy that electrocution was determined to be the cause of death.

CAUSE OF DEATH

The medical examiner listed the cause of death as electrocution with severe coronary artery disease as another significant contributing condition not resulting in the underlying cause.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Provide assurance that electrical systems are de-energized and tested to verify that they are de-energized prior to any work being performed on them.

Discussion: It is important for employees engaged in electricity associated work to fully understand and respect the dangers of working with electricity. U.S. Department of Labor OSHA Standard 27 CFR 1910.333 (a)(1) requires live parts to which an employee could be exposed be de-energized and tested before work is performed on or near them.

Recommendation #2: Employ proper lock out and tag procedures that are followed at all times.

Discussion: Although the elevator car itself had been properly de-energized prior to service, the victim remained exposed to energized equipment in the work area. U.S. Department of Labor OSHA Standard 29 CFR 1910.147 (d)(4)(i) requires when employee's are exposed to the potential of serious injury or death, lock out and tag devices be affixed to energy isolating devices to prevent the possibility of exposure.

Recommendation #3: Develop safety programs that provide a system of inspection and evaluation to ensure worker compliance with safe work procedures and ensure program effectiveness.

Discussion: Employers should consider and conduct daily inspections and evaluations of each worksite to identify all hazardous conditions. These inspections/evaluations should be both scheduled and unscheduled while workers are actually performing their tasks to ensure they are being carried out in a safe and effective manner.

Recommendation #4: Consider use of battery powered electrical lighting systems when performing electricity related maintenance.

Discussion: When separate branch circuits remain live to provide lighting by which employee's perform electricity related work, consideration should be given to the use of portable battery operated lighting, thus enabling **ALL** work area electrical circuits to be de-energized, locked out and tagged to prevent incidental exposure.

Recommendation #5: Implement a medical surveillance program that mandates employees suffering work related mishaps seek immediate medical attention regardless of severity.

Discussion: Although the victim had unknowingly been suffering from severe coronary artery disease long before his death, the momentary electrical charge most probably sent his heart into fibrillation (rapid irregular contractions of muscle fibers) which prompted his death 50 - 60 minutes later. An employer mandated annual or bi-annual physical examination may have revealed the victim's severe coronary artery disease. Further, an employer mandated medical surveillance program requiring the victim to seek prompt medical attention following the electrical charge, regardless of the severity, may have revealed the imminent life threatening condition before it took his life.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor 29, July 01, 1990: Parts:
   1910.147 (d)(4)(i),
   1910.333 (a)(1)

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