MASSACHUSETTS DPH/DLI/NIOSH
FACE MA-92-02
DATE: May 04, 1992

TO: Director, Massachusetts Department of Public Health, Occupational Health Surveillance Program

FROM: Massachusetts Fatal Accident Circumstances and Epidemiology (MA FACE) Project Field Investigator

SUBJECT: Facilities Maintenance Foreman Dies in Fall From Ladder in Massachusetts

---


SUMMARY

A 72 year old male facilities maintenance foreman received a 600 volt electrical shock causing him to fall 12 feet from a wooden portable step ladder while dismantling a live interior dual-track overhead crane system at a family owned computer software reproduction facility in Massachusetts. On the day of the incident, the victim was working with a maintenance department co-worker preparing soon to be leased warehouse space for occupancy. The victim was foreman of a three man in-house facilities maintenance crew. The victim and the co-worker had been dismantling three end to end sections of track on the non-energized side (dead side) of the crane system. The Massachusetts Department of Labor and Industries FACE Investigator concluded that the victim, believing the crane system to be de-energized and once attaining the desired height on a 12 foot portable wooden step ladder, made direct contact with either the wiring feed or the live track itself, yelled, and fell to the concrete floor below striking his head. The victim died seven days later as the result of injuries sustained in the fall. The Massachusetts FACE Investigator concluded that in order to prevent future similar occurrences, employers should:

* develop, implement, and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards, especially electrical hazards

* ensure strict compliance with current standards that require electrical systems be de-energized and tested to verify that they have been de-energized, and/or locked out/tagged out and tested prior to any work being performed

* utilize services of area qualified electrical contractor or in-house qualified personnel to perform and document hazard/risk assessment and address the appropriate measures to be taken to safely perform the necessary task(s)

## INTRODUCTION

The Massachusetts FACE Investigator was notified on November 26, 1991, by the Massachusetts Department of Labor and Industries that a municipal police department sergeant reported a 72 year old male facilities maintenance foreman had died the previous day as the result of injuries suffered on November 18, 1991, when he contacted an energized 600 volt interior dual-track overhead crane unit while dismantling it, and fell from a ladder to the floor below. The MA FACE Investigator then immediately initiated an investigation of the incident. On December 04, 1991, the MA FACE Investigator reviewed the incident with a company representative (who was also the victim's son), the co-worker, and an on-site electrician who was elsewhere in the facility and responded immediately after the incident. Multiple photographs, police report and co-worker statement regarding the incident were obtained during the investigation.

The employer in this incident was a computer software reproduction/duplication facility that had been in business for 11.5 years. The company which employed 120 employees had no written safety program or safety director. No safety training of any kind was provided. Each department foreman was responsible for department safety. The victim in this incident had worked for this employer for 10 years, all of it as its' facilities maintenance foreman. He was a retired long distance truck driver who was designated department foreman by his son-in-law and children who own the company.

## INVESTIGATION

November 18, 1991 was typical of most other business days at this 120 employee, family owned Massachusetts computer software reproduction facility. The company's facilities maintenance department, however, was busy readying additional warehouse space elsewhere on the property for expansion occupancy (incident site was leased to another property tenant at time of incident).

The men had been assigned the task of dismantling an old crane system which had not been used for many years. The crane system was suspended from interior overhead building members and was of I-Beam construction consisting of two horizontal I-Beam tracks (runways) some 18 feet apart. Between and on these tracks, a crossover beam or crane bridge transports the hoist apparatus for lifting/lowering purposes.

On the day of the incident, the facilities maintenance foreman and one of his workers were busy dismantling the 2,000 lb. capacity interior dual-track overhead crane to create space for planned erection of storage racks. The victim and the co-worker had completed removal of three end to end sections of track on the non-energized dead side prior to commencing removal of the first section of track from what would soon be determined to be the energized live side. As well, the energized live side was a series of end to end I-Beam tracks butted together and energized as an open conductor (track) used to transmit electrical current and provide power to the end truck(s). Prior to scaling his 12 foot wooden portable step ladder, the co-worker had asked his supervisor (the victim) whether he was sure this side was indeed de-energized. The victim responded that it was and had been for years. Once on the ladder, the co-worker used a screwdriver to pop loose the junction cover between two sections of track. In so doing, he felt a substantial shock which caused the screwdriver to fly out of his hands. He immediately descended the ladder and informed his supervisor (the victim) that the crane was indeed energized. The victim responded that it was impossible...it had long been disconnected.

The victim then instructed the co-worker to move the ladder closer to where the electrical wires energized the live track of the crane and proceeded to climb the ladder. It is speculated that the victim intended to assess if the system was indeed energized, and if so, deenergize it by removing wire nuts to separate the wires. He then either contacted the wire(s) or the rail itself, yelled, and fell backwards striking his head on the concrete floor 12 feet below. The co-worker immediately yelled for someone to call an ambulance. The victim was lying on the floor face-up and bleeding from the left ear and mouth. He appeared to be choking and was turned on his side and cleared of blood from his mouth. Within minutes the Police arrived. Paramedics arrived shortly thereafter. He was subsequently transported to the hospital. The victim initially survived the incident but died seven days later as a result of injuries sustained in the fall. Injuries included fractured skull, severe brain damage, broken back, broken ribs, and a collapsed lung.

Note: Subsequent investigation of the site found visible signs of a fingerprint pattern on the rail in close proximity to the wiring feed. Police Department photographs on the day of the incident show that while the victim remained convinced that the crane was de-energized, the manual disconnect wall switch was in the " On " position feeding the crane with 600 volts phase to ground. The manual disconnect at the time of the FACE investigation was in the " Off " position.

CAUSE OF DEATH

The Medical Examiner certified the cause of death as multi-system failure, sepsis, and multiple blunt trauma resultant of the fall.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Employers should develop, implement, and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards, especially electrical hazards.

Discussion: In this incident the victim took it upon himself to determine if the crane was energized, and if so, to de-energize it. This procedure exposed the victim to live electrical conductor(s). Employers should evaluate the tasks performed by employees; identify all potential hazards; and then develop, implement, and enforce a comprehensive safety program addressing these issues as already established by OSHA Standard 1926.21 (1.). This safety program should include, but not be limited to, employee training in electrical hazard recognition.

Recommendation #2: Employers should ensure strict compliance with current standards that require electrical systems be de-energized, and/or locked out/tagged out, and tested prior to any work being performed.

Discussion: The crane system was not de-energized before attempting to dismantle it. Disconnection of the crane from its electrical source coupled with testing by a trained individual would have taken a minimal amount of time in this case and would have prevented this incident. Massachusetts Department of Labor and Industries Regulations and OSHA Standards 29 CFR 1926.416 and 29 CFR 1926.417 address requirements for protection of employees from contact with energized circuitry and the provisions for appropriate lock-out tag-out procedures. If necessary, a task of this type could have been scheduled at a time (a weekend or before/after hours) when the incoming power could be de-energized without disrupting operations. Employers should develop specific job procedures for tasks that are performed by employees, including de-energizing electrical circuits before beginning to work on them, and verifying that the system has been de-energized.

These procedures should detail the various safety hazards associated with each task. Once these specific procedures have been developed, employers should ensure that they are implemented and enforced by a qualified person at each jobsite.

Recommendation #3: Employers should understand when/if recommendations outlined above are neither feasible nor possible, consideration should be given to utilizing the services of either an outside electrical contractor or qualified in-house personnel to perform an document hazard/risk assessment and address the appropriate measures to be taken to safely perform the necessary task(s).

Discussion: Given the victim's employment background and degree of electrical expertise, or lack thereof, employers should consider utilizing specially trained outside electrical contractors or task specific, specially trained and licensed in-house personnel to perform specialty type tasks. In this particular incident, a licensed electrician working in another area of the facility could have been summoned at a moments notice to properly address the situation at hand.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor 29 Parts 1926.416 and 1926.417 (1990)

2. Commonwealth of Massachusetts: Code of Massachusetts Regulations, Labor 454 Parts 10.10.91 (3) and 10.91 (7) (1988)