

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

**FROM:Massachusetts Fatality Assessment and Control
Evaluation (MA FACE) Program Field Investigator**

**SUBJECT:Massachusetts Maintenance Foreman Dies When Crushed
Beneath Steel Framework - 93-MA-010-01**

DATE:March 31, 1994

SUMMARY

On June 21, 1993, a 41 year old male maintenance mechanic was crushed to death at an iron foundry when a 1,500 pound steel frame he was uprighting fell on him. The victim was working alone with a chain fall, and was apparently beneath the load when the steel platform fell on him, crushing his head and shoulders. A nearby co-worker immediately summoned the help of others to remove the load from the victim, and emergency medical services were called. EMT and paramedic personnel quickly arrived and attempted to revive the victim without success. He was pronounced dead at the regional hospital approximately twenty five minutes following the incident. In order to prevent similar future occurrences, the MA FACE Program Field Investigator recommends that employers:

- ensure that employees are prevented from working beneath suspended loads
- ensure that equipment used to lift heavy loads is in suitable condition and of sufficient strength to safely complete the task
- require employees to lift excessively heavy loads with the aid of others.

INTRODUCTION

On June 22, 1993, the state medical examiner's office telephoned the Massachusetts Occupational Fatality Hotline to report the death of a 41 year old male iron foundry maintenance mechanic on the previous day. MA FACE initiated an investigation. It was not possible, however, to survey the site and interview company personnel until September 9, 1993. The municipal police report, death certificate, OSHA report and assorted newspaper articles were obtained during the course of the investigation.

The company was a gray iron foundry which manufactured manhole structures, covers and associated parts. It was established in 1855, and was the last remaining iron foundry in a formerly

active regional iron industry. It employed 88 individuals in various foundry related manufacturing and office capacities, one shift per business day. The maintenance crew consisted of 4 employees, 3 of whom held the same job title as the victim. The company had a joint labor/management safety committee and written general safety rules and procedures in place at the time of the incident. It did not, however, have written safety rules or procedures in place for the task being performed by the victim. Furthermore, the company did not provide safety training for the maintenance mechanics. The company generally required a demonstration of competence before allowing employees to perform work duties alone, or without direct and immediate supervision.

The victim was a maintenance mechanic whose duties included keeping the plant and its equipment operational. He had worked for the company for over 18 years and was the president of the regional local of the glass molders and pottery workers union. His maintenance mechanic training was primarily on the job.

INVESTIGATION

During the 8 months prior to the incident, the employer had borrowed some equipment from another company while it was awaiting the delivery of a prefabricated steel frame for its conveyor system. Once permanently situated, the steel frame would be equipped with an electrical feeder, pneumatic transporter, separator, and pipelines, and would be used in the company's conveyor system which fed ferrosilica into the iron mainstream.

Approximately one week before the incident, the victim and his supervisor had discussed that the new steel frame was to be quickly installed after its arrival. The employer wanted quick installment of the new frame because the current system had been on loan for eight months.

On the day of the incident, the prefabricated framework was delivered and left in the company yard. Although he did not receive direct orders from his supervisor to situate the platform that day, the victim moved the framework by forklift from an area in the outer yard to an interior area of the plant where it was to be permanently situated.

The victim was using a chain fall to upright the platform from a horizontal position to a vertical position for its permanent location. A co-worker approximately fifteen feet from the victim noted that the victim first draped a chain sling over the beam of an adjacent steel drum storage structure. The chain sling was then wrapped in an unknown manner around the platform to be uprighted. Apparently, each time the chain fall was pulled to raise the load, the victim was beneath the load. When the victim had hoisted the platform to an approximately 60 degree angle, the platform fell on his head and shoulders, pinning him beneath the weight.

Co-workers were quickly successful in removing the structure from on top of the victim while emergency medical services were summoned. Upon arrival, emergency medical technicians and paramedics tried unsuccessfully to revive the victim. He was pronounced dead at the regional hospital approximately twenty five minutes following the incident.

A subsequent inspection of the steel alloy chain sling used to upright the platform, revealed that the throat opening of the hook was too large and that one link of the chain sling was twisted. These defects, in particular the large hook opening, may have contributed to the equipment failure.

CAUSE OF DEATH

The medical examiner listed the cause of death as multiple injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1:Employers should ensure that employees are prevented from working beneath suspended loads.

Discussion: OSHA Standard 29 CFR 1910.184(c)(9) requires employees to be kept clear of suspended loads, or loads about to be lifted by slings. If the victim had not been standing underneath the load, the steel frame may have fallen to the concrete floor without fatally injuring him.

Recommendation #2:Employers should ensure that equipment used to lift heavy loads is in suitable condition and of sufficient strength to safely complete the task.

Discussion: The steel alloy chain sling used to upright the platform was found to be defective in the post-incident inspection. These defects may have, at least partially, caused the steel frame to fall from the chain sling. OSHA standard 1910.184 (d) requires daily inspection of slings for defects each day they are used, and damaged or defective slings are to be immediately removed from service. Sub-section (e) of the same standard calls for regular, periodic inspection of alloy steel chain slings, and for companies to maintain records of these inspections. Employers should routinely inspect equipment which is used to lift heavy loads in order to ensure that the equipment is in proper working order. Had the equipment been inspected prior to its use, the incident may have been prevented.

Recommendation #3:Employers should require employees to lift excessively heavy loads only with the aid of others.

Discussion: Tasks involving the manual movement of heavy materials should generally be conducted by two or more individuals. In addition to reducing the risk for serious or fatal injury, two (or more) person lifting can minimize the risk for back strain. Had the victim's coworkers assisted him in guiding the platform on its vertical base, and had properly working equipment been used, this incident may have been prevented. In order to encourage employees to seek the help of co-workers when lifting heavy objects, employers should train them in manual lifting and in hazard awareness.

LIST OF REFERENCES

Office of the Federal Register: Code of Federal Regulations,
Labor 29 Parts 29 CFR 1910.184(c)(1) and 29 CFR 1910.184(c)(9)
(1990)