

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

**FROM:Massachusetts Fatality Assessment and Control
Evaluation (MA FACE) Project**

**SUBJECT:Massachusetts Specialty Foundation Company Laborer
Dies in Machinery Entanglement - MA-93-07**

DATE:June 28, 1994

SUMMARY

On May 25, 1993, a 23 year old specialty foundation company laborer died when he became entangled in the revolving auger of a drilling machine at a university construction site. The victim was employed to assist the machine operator during drilling processes, and was using a shovel to clear the earth brought up by the auger when the incident occurred. His clothing was caught by the auger, and his body pulled in by the revolving motion. The victim was spun multiple times around the auger before the drill operator was able to stop the machine. The victim suffered catastrophic injuries, resulting in immediate death on the scene. The MA FACE Project concluded that to prevent similar future occurrences, employers and equipment manufacturers should:

- ensure that all jobsite machinery is suitably safeguarded to prevent employee injury
- minimize the need for personnel to work in close proximity to hazardous machinery which can cause serious physical harm or death
- ensure that operators of highly hazardous machinery do not leave the point of operation unattended, particularly when other employees are working in close proximity to unguarded, dangerous parts
- ensure that employee clothing does not create an unnecessary hazard.

INTRODUCTION

On May 25, 1993, the Regional OSHA Office informed the Massachusetts FACE Project that a 23 year old laborer had been killed in a machine entanglement on a university construction site earlier in the day. On May 27, 1993, the MA FACE Field Investigator travelled to the scene of the incident and interviewed campus police officials, campus life safety and risk management personnel, campus legal counsel, insurance carrier personnel and the construction project manager. The campus police report, death certificate, corporate organization papers, assorted newspaper clippings and multiple

photographs were obtained during the course of the investigation.

The employer was a specialty foundation, underpinning, and grouting construction company in business for 5 years. Employing approximately 20 persons, the company had 7-10 employees who held the same job title as the victim. At the time of the incident, the company was on the construction site for two weeks and employed a crew of six. The company employed a designated safety person who was also job superintendent. He devoted more than half of his time to safety. The company had written safety rules and procedures in place for all company related tasks. The victim was apparently following these rules at the time of the incident.

The victim's safety training was primarily on the job. He had been employed by the company for approximately one year and had been on the jobsite for two weeks at the time of the incident.

INVESTIGATION

At the time of the incident, the employer was involved in the total renovation of a multiple floor building which a major Massachusetts university was transforming into a preparatory school. The company was contracted to drill and insert 63 pilings which would underpin the basement and foundation, and prevent the foundation's displacement. To perform the work the company employed a drilling machine which was powered by a diesel hydraulic system. The auger was approximately eight inches in diameter and spun at 200 revolutions per minute.

The victim was assigned the task of shoveling the excavated soil from around the auger. He had to work immediately next to (within feet of) the revolving auger in order to perform the job. The victim had been warned of the danger of wearing loose clothing around the auger, and had taken precautions that morning to tape his rain slicker close to his body. Nevertheless, as the 34th hole was being drilled through the concrete floor and into the earth, an appendage on the auger apparently caught the arm area of the victim's rain slicker. The victim was immediately pulled into and spun around the auger multiple times before the machine operator could disengage the machine. The machine operator was unable to immediately disengage the drilling machine because he had walked away from the it while it was running, and had to make his way back to the control panel in order to hit the emergency stop button.

University and municipal police officials, municipal fire department personnel, EMT/paramedic units, county district attorney officials, a state medical examiner's office representative, and an OSHA compliance officer immediately responded to the incident scene. According to several of these individuals, the victim suffered catastrophic bodily injuries and was most likely dead within moments of his entanglement.

CAUSE OF DEATH

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

RECOMMENDATIONS/DISCUSSION

Recommendation #1:Employers and equipment manufacturers should ensure that all jobsite machinery is suitably safeguarded to prevent employee injury.

Discussion: On July 1, 1993 the OSHA standard, 29 CFR 1926.300(b), went into effect requiring machine guarding at construction sites. This standard specifies that machine hazards created by rotating parts, point of operation, ingoing nip points, flying chips and sparks, etc., should be suitably guarded. Although there was no requirement for machine guarding on construction sites at the time of the incident, the hazard(s) associated with the operation of the drilling machine should have been identified and addressed. Had a safeguard been designed, constructed and affixed to the machine to prevent personnel from having any part of their body enter into the danger zone during the operating cycle, this incident could have been avoided.

Possible safe guarding techniques which equipment manufacturers should consider include guarding the bit of the auger with a casing, or with an interlock system or sensor device. An interlock system would disengage the drilling machine in the event that an employee came within close proximity of the auger. Equipment manufacturers should also consider streamlining the upper attachments on the auger; this would lower the risk of an employee becoming entangled in the auger.

Recommendation #2:Employers and equipment manufacturers should minimize the need for personnel to work in close proximity to hazardous machinery which can cause serious physical harm or death.

Discussion: Equipment manufacturers should explore the feasibility of developing an automatic conveyor system which would automatically remove the earth from around the auger of drilling machines used on construction sites. This would eliminate the need for a human operator to work in close proximity to the drill bit, and thus drastically reduce the potential for future fatal injury. This type of equipment was developed for, and has been successfully used, in the mining industry. In addition, employers should minimize the need for employees to work within close proximity to hazardous machinery by providing employees with long handled shovels for clearing the earth from auger bits. Although this would not eliminate the need for an operator to work in close proximity to the auger, by increasing the distance between the operator and the bit, it could reduce the risk for fatal injury.

Recommendation #3:Employers should ensure that operators of highly hazardous machinery do not leave the point of operation unattended, particularly when other employees are working in close proximity to unguarded, dangerous parts.

Discussion: The machine operator was unable to immediately stop the drilling machine because he had walked away from the control panel where the emergency stop button was located. Had the

operator been standing at the control panel when the victim was first caught in the auger, he may have been able to stop the machine before the victim was fatally injured. Employers should prohibit machine operators from walking away from emergency stop buttons while hazardous, and particularly unguarded, machinery is in operation.

Recommendation #4: Employers should ensure that employee clothing does not create additional hazards.

Discussion: As with hard hats, safety glasses, shoes and other types of protective equipment, all employee clothing should be appropriate for the type of work being performed. Loose and/or ill fitting clothing that is worn around hazardous machinery should be strictly forbidden. In this case the victim took precautions to tape his clothing to his body; however, he was still caught in the auger. Employers should explore the feasibility of having employees wear tear away clothing for personal protection when working around hazardous machinery.

LIST OF REFERENCES

Office of the Federal Register: Code of Federal Regulations,
Labor 29 Parts 1910.212 (1992)