

The Missouri Department of Health in co-operation with the National Institute for Occupational Safety and Health (NIOSH) is conducting a research project on work related fatalities in Missouri. The goal of this project, *Missouri Fatal Accident Circumstances and Epidemiology* (MO FACE), is to show a measurable reduction in traumatic occupational fatalities in the State of Missouri. This goal will be met by identifying causal and risk factors that contribute to work related fatalities. The identification of these factors will enable more effective intervention strategies to be developed and implemented by employers and employees. This project does not determine fault or legal liability associated with a fatal incident nor with current regulations. All MO FACE data will be reported to NIOSH for trend analysis on a national basis. This will help NIOSH provide employers with effective recommendations for injury prevention. All personal/company identifiers are removed from all reports sent to NIOSH to protect the confidentiality of those who voluntarily participate with the program.

FACE INVESTIGATION # 92MO02301

SUBJECT: Journeyman Ironworker Dies Following a Twenty-Two Feet-Six Inch Fall from a Steel Structure in Missouri.

SUMMARY:

A 51-year-old journeyman ironworker died after falling twenty-two feet-six inches from an eight inch-wide steel girder at a discount store construction site. Before the incident, the victim was welding steel bar joists to steel girders. The fall was unwitnessed, however, it is believed that the victim was moving to weld the next bar joist and pulled on the welding cable, causing the welding cable connector to separate and the victim to lose his balance. He fell head first to chat covered ground. Although fall protection equipment was available it was not utilized at the time of the incident. The MO FACE investigator concluded that, in order to prevent future similar occurrences, employers should:

- * provide and enforce the use of personal protective equipment.
- * develop and implement safe methods for handling welding cables while working at heights.
- * consider and address worker safety in the planning phase of construction projects.
- * consider the use of other approaches, such as elevated work platforms, to safeguard workers from falls.

INTRODUCTION:

On July 27, 1992, a 51-year-old journeyman ironworker died as a result of injuries he received from a twenty-two feet-six inch fall at a construction site. The Occupational Safety and Health Administration (OSHA) was notified the same day. On July 28, 1992, the MO FACE investigator and an OSHA official conducted an investigation at the incident site. Interviewed were the field supervisor, job site foreman, a union representative, and two co-workers. The MO FACE investigator obtained the ambulance trip report,

coroner's report and photographs of the accident site.

The steel supply company has been in business for 72 years. Including their subsidiaries they employ approximately 300 persons. The steel erection subsidiary has one permanent employee, the president. The iron workers are hired from the local union. At the time of the incident, there were 12 iron workers and the job site foreman at the construction site. The victim had approximately 30 years experience as a journeyman iron worker and had been with the company for five years. The company has a corporate level safety manager. Their field supervisors and job site foremen are responsible for work-site safety issues and weekly "tailgate" safety meetings. The company has a written safety policy and provides fall protection equipment. They require that workers wear hard hats and work boots.

INVESTIGATION:

The company had contracted to erect the steel skeleton and roof of a discount store super center. They arrived at the construction site five days prior the incident and began erecting the structural steel skeleton framework. This skeleton framework consisted of vertical steel columns, horizontal steel joist girders, and steel bar joists. The columns are bolted upright to concrete foundations and the joist girders are then secured between two columns. The bar joists, sometimes called bridging, are then set in bundles between two joist girders. Bridging is a system of lateral braces placed between the joist girders to distribute the load on the roof, and hold the joist girders in position. The bridging is then distributed five feet apart and welded to the girders.

On the day of the incident, the crew reported to work at their normal time. The job site foreman conducted a "tailgate" safety meeting and work proceeded as usual. At 10:00 am, prior to the incident, the crew had a 15 minute coffee break. The victim was reportedly in good spirits and good health.

After the break, the workers returned to their tasks. Two co-workers were working ahead of the victim distributing bridging five feet apart. The victim was following along and welding the bridging to the girders. Typically the iron workers secured their lanyards to a structural member when working in one area for an extended period of time. Since the task of distributing and welding these structures requires extensive moving along the structure of the building, the use of any fall protection was not justified by the company while working at this height.

Although the fall was unwitnessed, it was believed that the victim had completed a weld and was moving to the next spot when the welding cable may have become snagged. The victim apparently pulled on the cable and the twist lock connector came apart. The victim apparently lost his balance and fell twenty-two-six inches to the ground. The welding cable and stinger were found with the victim. Workers in the area stopped and summoned help. The job-site foreman attended the victim, but after surveying the extent of the injuries, opted not to administer aid. Emergency medical services personnel arrived within 10 minutes and found victim lying face down in a large pool of blood with no pulse or respiration. No resuscitation efforts were made due to obvious mortal wounds. The coroner was summoned to the scene and pronounced the victim dead.

CAUSE OF DEATH:

Massive open and closed head injuries.

RECOMMENDATIONS/DISCUSSION:

RECOMMENDATION #1: Employers should comply with existing OSHA regulations regarding fall protection for workers.

DISCUSSION: OSHA Standard 29 CFR 1926.28(a) states, "The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part indicates the need for using such equipment to reduce the hazards to the employees." Safety belts and lanyards were provided for the employee, however, the victim was not tied off to a secure point and no lifeline was present to use as a tie-off point.

RECOMMENDATION #2: Employers should develop and implement safe methods of handling welding cables.

DISCUSSION: When welding cables are used in long lengths with several connections stringing them together, there is a possibility that the connections will get snagged on the structure. The proper method to handle the situation is to trace the cables back to where they are snagged. Either the welder or the co-workers should routinely check the cable to determine where they are snagged and free them if possible. This person should also check the connection to ensure that it is secure. A brief, periodic "tailgate" discussion of the proper methods of handling cables might have re-enforced the victim's understanding of the need to take a few minutes to handle the cables in a safe manner.

RECOMMENDATION #3: Employers should address worker safety in the planning phase of construction projects.

DISCUSSION: Worker safety issues should be discussed and incorporated into all construction projects during the planning phase and throughout the entire project. The planning for and incorporation of safety measures, prior to any work being performed at construction sites, will help to identify potential worker hazards so that preventive measures can be implemented at the site.

RECOMMENDATION #4: Employers should consider the use of other approaches for the reduction of worker exposure to falls from elevation.

DISCUSSION: Use of an elevated work platform, such as a scissors lift or other device, might have reduced the welder's exposure to this fall hazard. Another approach to fall protection would be the use of safety nets. An alternative method of construction would be to assemble sections of joist girders and bridging on the ground and then lift the completed sections into place, provided it would not expose the workers to additional hazards.

REFERENCES:

Office of the Federal Register, Code of the Federal Regulations, Labor, 29 CFR 1926.28, pp.21. July 1, 1991.

Daryl W. Roberts
Chief
Bureau of Environmental Epidemiology

Terry L. Hopper
Industrial Hygienist Supervisor
Bureau of Environmental Epidemiology

Thomas D. Ray
Missouri FACE Program Coordinator
Chief Investigator