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 #92MO02801

SUBJECT: Production Worker Dies Following Contact with 220 Volts of Electricity in Missouri.

SUMMARY:
A 20-year-old female production worker at a plastic injection molding company died after coming in contact with 220 volt alternating current (ac) electricity. At the time of the incident the employee was operating a plastic grinding machine. The separate on and off buttons were located inside a metal switch box on the front of the machine. The cover plate had been removed and not replaced for an undeterminable length of time. The victim reached to push the off button and missed allowing her finger to pass by the button and contact the 220 volt power source. The victim maintained contact with the power source until a co-worker de-energized the machinery. The MO FACE investigator concluded that, in order to prevent future similar occurrences, employers should:

* ensure that all switch boxes have appropriate guarding in order to prevent contact with energized parts.

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

* train employees in Cardiopulmonary Resuscitation (CPR).

INTRODUCTION:

On August 11, 1992, a 20-year-old production worker at a plastic injection molding company contacted 220 volts (ac) in an uncovered electrical box, housing the on and off buttons. The MO FACE investigator was notified of the fatality by the county coroner on August 12, 1992. The Occupational Safety and Health Administration was also notified and investigated the incident.

The MO FACE investigation was initiated on August 13, 1992 with an interview with the employer and tour of the incident site. Also interviewed was the county coroner. The MO FACE investigator obtained a copy of the coroners report, the emergency medical service run sheet, the police report, and the death certificate.

The company involved had been in operation for five years and six months. At the time of the incident 17 persons were employed, 12 of which had the same job title as the victim. The victim had been employed by the company for approximately five weeks. The employer did not have a designated safety officer or written safety plan at the time of the incident. Employee training was accomplished on the job. The employer provided hearing and eye protection to the employee.

INVESTIGATION:

This plastic injection molding company manufactures small furniture fixtures, toy items, and plastic funnels. This operation runs three shifts, the victim was working a 2:55 pm to 11:10 pm shift. At the time of the incident, approximately 9:30 pm, there were 4 employees present. The victim and a co-worker were each operating a shaping/molding machine and a drying machine and shared the use of a waste plastic grinder. The victim was operating the Cumberland brand 8x10, serial #39006180, plastic grinding machine. This is a mobile piece of equipment which can be utilized throughout the facility. It is plugged in to a 220 volt ac outlet in the area where it is to be used. The production worker uses this grinder for preparing waste plastic for reuse into the injection molding process.

The victim was using this piece of equipment at the time of the incident. It was positioned in her usual work station and was not in contact with any other piece of equipment. It was insulated from the concrete floor by its rubber wheels. It was plugged into a 220 volt outlet located in the work area. The electrical connections were in good condition. The machinery is activated by the use of a separate on and off button. These buttons were mounted on a switch housed in a switch box mounted on the front of the machine. This switch box was much larger than the switch located inside it and allowed easy access to the energized parts inside. Apparently the victim went to activate the off button and missed. Her fingers slid by the button and contacted the energized part of the switch. The victim was electrocuted by the 220 volt power source.

According to an interview with the co-worker, she normally works with her back to the victim and the grinder. She heard a noise coming from the victim, as if she was trying to speak. She turned to see the victim lying against the machine with her right hand inserted into the switch box housing the on/off buttons. Sparks were being emitted around her hand. The co-worker immediately pulled the plug on the grinder and summoned help. The victim fell to the floor following the de-energization of the machinery.

The emergency medical service was summonded to the incident site. The plant employees had no CPR training and the victim was offered little assistance until the EMS arrived. Upon their arrival victim was found lying on her left side. The victim had no pulse, no respiration and no blood pressure. CPR was initiated as well as Advanced Cardiac Life Support (ACLS). Attempts to resuscitate the victim were continued in route to the local hospital where she was pronounced dead shortly after arrival.

CAUSE OF DEATH:

Cardiac arrest due to electrocution

RECOMMENDATIONS/DISCUSSION:

RECOMMMENDATION #1: Employers should ensure that all electrical equipment have appropriate guarding in order to prevent contact with energized parts.

Discussion: Live parts of electrical equipment operating at 50 volts or more should be guarded against accidental contact by approved cabinets or other forms of approved enclosures.
[29 CFR 1910.303(g)(2)(I)]

RECOMMENDATION #2: Employers should develop, implement, and enforce a comprehensive safety program which includes worker training in recognizing and avoiding hazards, especially electrical hazards.

Discussion: Employers should emphasize safety to their employees by developing, implementing, and enforcing a comprehensive safety program. The safety program should include, but not be limited to, training workers in recognition and avoidance of electrical hazards, emergency preparedness, and the proper selection and use of personal protection equipment.

RECOMMENDATION #3: Employees who work around electrical circuits, and electrical equipment should be trained in cardiopulmonary resuscitation (CPR).

Discussion: According to a NIOSH Alert, *Request for Assistance in Preventing Fatalities of Workers Who Contact Electrical Energy* (NIOSH Publication 87-103), "Prompt emergency medical care can be lifesaving for workers who have contacted either low voltage or high voltage electrical energy. Immediate cardiopulmonary resuscitation (CPR) followed by advanced cardiac life support (ACLS) has been shown to save lives."

REFERENCES:

Office of the Federal Register, Code of the Federal Regulations, Labor, 29 CFR 1910.303(g)(2)(i),

pp.313. July 1, 1991.

National Institute for Occupational Safety and Health, NIOSH Alert, *Request for Assistance in Preventing Fatalities of Workers Who Contact Electrical Energy*, Publication Number 87-103, December, 1986.

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