**FACE INVESTIGATION #96MO054**

**SUBJECT Equipment Operator Dies Following Fork-Lift Truck Roll-Over**

## SUMMARY

A 24-year-old fork lift truck operator died after the lift truck he was operating over turned. The victim was operating the equipment in the storage yard of a wire mill. A length of wire became rapped around the front drive trans-axle, severing the hydraulic brake line. As he was returning to the plant with two empty wire spools the brakes failed on the truck. He was traveling down an incline and turned abruptly to avoid striking stored material. The sharp turn caused the truck to overturn. The victim tried to jump free but was struck by the truck's Roll Over Protective Structure (ROPS) of the truck..

The MO FACE Investigator concluded that, in order to prevent similar occurrences, ALL employers should incorporate the following recommendations into their safety and health plans:

- **ensure that all forklift operators are aware of the hazards of attempting escape from equipment during overturns, and emphasize that operators remain inside the protection of the ROPS with seat belt fastened;**
- **ensure that operators conduct pre- and post-shift vehicle inspections;**
- **consider equipping vehicles with guarding that will protect vulnerable brake lines from incidental damage;**
- **consider using forklift trucks equipped with pneumatic tires for use outside;**
- **develop, implement and enforce a comprehensive safety program that includes, but is not limited to, training in hazard recognition and avoidance.**

## INTRODUCTION

On July 16, 1996, a 24-year-old forklift truck operator died after the truck he was operating overturned. The victim was employed by a wire mill that manufactures a variety of wire products. He had been employed with the company for one month and sixteen days. He was certified to operate the forklift and was operating the machinery according to standard operation procedures. He had received training in the safe operation of lift trucks, as well as safety training in a variety of other topics including hazard identification, and safe work procedures.

The employer in this incident is a national firm established in 1883 and employing more than 19,000 workers. The wire plant facility was established in 1970 and employed approximately 200 persons at the time of the incident. The company participates in the Occupational Safety and Health Administration (OSHA) Voluntary Protection Program (VPP), and this was the first fatality incident at this facility. The company has a written safety plan and written safety rules and procedures for the specific task performed by the victim. This facility has a safety director and a safety and environmental director, both employed full time.

### INVESTIGATION

On July 16, 1996, at approximately 6:45 p.m., a 24-year-old fork-lift truck operator died after the lift truck he was operating overturned. The MO FACE Chief Investigator was notified of the incident on July 17, 1996, and conducted an incident site investigation on July 18, 1996. OSHA was notified by the company and was on site upon arrival of the MO FACE investigator. The incident site was surveyed and interviews were conducted with company officials including the plant manager, safety directors, and legal staff.

The victim worked 12-hour shift schedules with work weeks of either 3 or 4 days. His normal work hours were 6:00 p.m. to 6:00 a.m. This was the third day of his work week. On the day of the incident the victim reported to work at his scheduled time. He was instructed by a production supervisor to bring in several empty wire spools from the yard. The victim and a co-worker exited the building and went to the yard. The victim was operating a Hyster, Model S10 48358 H11OXL, rated at 15,100 pounds. The lift truck was equipped with solid tires and single lift spear used to carry the spools. The victim and co-worker loaded two wire baskets on the truck and the victim proceeded to return to the plant.

The plant's yard consisted of loose gravel lanes and grassy areas. As the victim was returning to the plant he was traveling down a slight slope using the established roadways. This lane went from a flat area where the empty spools are stored to an area of about 3% grade, then to the steepest grade of 6%, then back to 3% grade. As he approached the steepest grade he tried to apply the brakes of the truck. The brakes failed and he proceeded down the grade with increasing speed. As he was

approached the bottom of the incline he turned sharply to avoid hitting some stored materials and the truck turned over. The victim tried to jump from the truck but the cab struck his lower body pinning him to the ground. Co-workers immediately came to the victim's aid and another lift truck lifted the vehicle off the victim. Emergency assistance was called to the scene and transported the victim to an area trauma center. The victim died a short time later.

#### CAUSE OF DEATH

The Certificate of Death lists the immediate cause as hemorrhagic shock and crushing injury to abdomen and pelvis

## RECOMMENDATION/DISCUSSION

**Recommendation #1: Employers should ensure that all forklift operators are aware of the hazards of attempting escape from the equipment during overturns and emphasize that operators remain inside the protection of the ROPS with seat belt fastened.**

**Discussion:** The lift truck in this incident was equipped with a ROPS and a seat belt. The seat belt was in good working condition but appeared that it had not been used recently. Seat belt use was required according to the employer's written safety plan, but may not have been currently being enforced. The victim apparently was not wearing the seat belt at the time of the incident. Seat belts are incorporated into the design of the ROPS to retain the operator in the operator's seat and within the confines of the protective structure in the event of a sudden stop or rollover of the equipment. Failure to use seat belts in association with ROPS has proven to be hazardous to equipment operators during a sudden rollover. Many times the victim tries to jump or is thrown from the operator's seat and into the path of the overturning equipment and protective structure.

**Recommendation #2: Employers should ensure that operators conduct pre- and post-shift vehicle inspections.**

**Discussion**: This investigation could not determine when or how the wire became rapped around the trans-axle. A pre- and post-shift vehicle inspection may have indicated a problem with the brakes or the operator may have visually identified the defect. Each operator should be assigned a

particular lift truck when possible for the duration of his shift or longer. This ensures that the operator becomes familiar with the operational controls of the vehicle and may be able to identify subtle changes in operation that may indicate maintenance is needed. It also ensures that the same pre- and post-shift safety checks are conducted on the same vehicle.

**Recommendation #3: Employers should consider equipping vehicles with guarding that will protect vulnerable brake lines from incidental damage.**

**Discussion:** The employer in this incident is responsible for this recommendation. Due to the nature of this facility, scrap pieces of wire are routinely found through-out the facility. Even with stringent housekeeping rules, pieces of wire of various lengths tend to be found. To prevent a similar occurrence guarding should be incorporated over the brake line to protect it from incidental damage.

**Recommendation #4: Employers should consider using forklift trucks equipped with pneumatic tires for use outside.**

**Discussion:** Fork-lift trucks for use on uneven surfaces and on dirt or gravel surfaces should be equipped with pneumatic tires. Fork-lift trucks with small solid rubber tires, are preferred for smooth solid floors, but do not fair well outside on soft uneven surfaces. Though the tire type on the truck involved in this incident may not have influenced the reaction of the truck to the sudden turn, proper tire selection may be crucial in the prevention of other incidents.

**Recommendation #5: Develop, implement, and enforce a comprehensive safety program that includes, but is not limited to, training in hazard recognition and avoidance.**

**Discussion:** All employers should emphasize the safety of their employees by developing, implementing, and enforcing a comprehensive safety program. The safety program should include, but not be limited to, training workers in the proper selection and use of personal protection equipment, along with the recognition and avoidance of hazards in the work environment.

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, known as the Missouri Occupational Fatality Assessment and Control Evaluation **(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 or 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.

**SIGNATURES:**

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**Chief Investigator**

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**Daryl Roberts**
**Chief**
**Bureau of Environmental Epidemiology**

## DISSEMINATION LIST

National Institute for Occupational Safety and Health NIOSH
Alaska State Department of Health and Social Services AK FACE Program
California State Public Health Foundation CA FACE Program
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Iowa State Department of Public Health IA FACE Program
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Missouri Department of Health, Office of Injury Control
Missouri Department of Labor and Industrial Relations
Missouri Department of Public Safety
Missouri Department of Social Services
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North Central Missouri Safety Council
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Safety Council of Greater St. Louis
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St. Joseph Safety Council
St. Louis City Medical Examiner Office
St. Louis County Department of Community Health
St. Louis County Medical Examiner Office
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