FACE INVESTIGATION: #96MO082

SUBJECT: Skid-Steer Loader Operator Dies After Backing Loader Off Six-Foot Retaining Wall

SUMMARY:

A 43-year-old skid-steer loader operator died after he backed off of a six-foot retaining wall. The victim was spreading top soil over an area in preparation for grass seeding. He had made numerous passes with the loader, back-dragging the bucket from the wall and up the slope. When he approached the end of the area being prepared, it appears he turned the skid-loader around and backed toward the wall, dragging his bucket. The skid-loader approached and backed over the wall. The loader struck the ground below and rolled to its side. The victim remained inside the cab but apparently was knocked unconscious and became wedged between the seat and the side screen.

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 equipment operators wear seat belts while operating equipment equipped with roll-over protective structures;**
- **ensure that all interlock safety devices are functional and in good working condition before any operation of the vehicle;**
- **develop, implement and enforce a comprehensive safety program that includes, but is not limited to, training in hazard recognition and avoidance.**

INTRODUCTION:

On September 20, 1996, a 43-year-old operator of a skid-steer loader, was spreading top soil at a new building construction site, when he backed the loader off of a six-foot retaining wall. The victim was an experienced equipment operator and was considered one of the best and productive operators for the landscaping companyfor which he worked. The landscaping company had been in business for 11 years and employed eight workers at the time of the incident. The company had contracted to do all the landscaping of the new building under construction by the building owner. They had been on the work-site for ten days prior to the incident. The employer provided on-the-job training and workers were required to show competence in operating equipment before they were allowed to operate the equipment unsupervised. The company owned three skid-steer loaders similar to the one involved in the incident, and employed four trained equipment operators. The company owner also fulfilled the job of safety officer and devoted up to 25 percent of his time toward worksite safety. The company did not have a written safety plan, and operators were instructed to obey all safety rules and procedures provided in the equipment operating manual provided by the manufacturer of the skid-steer loader. Safety training for the workers included on-the-job training and review of the equipment manuals.

INVESTIGATION:

On September 20, 1996, at approximately 3:00 p.m., a skid-steer loader operator died after backing the loader off of a six-foot retaining wall. At approximately 5:00 p.m. the same day, the county medico-legal death investigator contacted the MO FACE Program giving notification of the fatality. The MO FACE investigator arrived at the incident site at 9:30 a.m., September 21, 1996. The investigator surveyed the incident site and interviewed the construction site manager, who was also one of the first persons to arrive at the scene. The investigator then proceeded to the county medical examiner's office where the victim's autopsy was taking place. The MO FACE investigator then returned the next day to attend the OSHA investigation and to interview the company owner and the company's safety consultant as well as photograph the equipment involved in the incident. The MO FACE investigator returned to the incident site on September 25 accompanied by a field investigator from the National

Institute for Occupational Safety and Health (NIOSH). The incident site was measured, and the investigators interviewed the employer and photographed the skid-steer loader involved in the incident. They also interviewed the County Medical Examiner and the county medico-legal death investigator. Also interviewed was the city detective who investigated the death and copies of the incident reports were obtained.

The company was contracted to provide landscaping services for a building under new construction. The company had been on site for 10 days prior to the incident. Activities prior to the incident included planting trees and shrubs, preparing the lawn base for top soil and spreading top soil over the property. On the day of the incident the workers arrived at the company office at about 7:00 am and loaded tools and equipment. They arrived at the incident site around 8:00 am and began spreading top soil. They broke for lunch around noon. After lunch they continued preparing and spreading top soil, and the company owner instructed the victim to continue spreading top soil around the incident site area and, when completed, join the rest of the crew at the back of the building. While the remaining crew was working on the back side of the building the victim continued his assignment.

The tracks left in the fresh soil indicated that the victim was spreading the soil as most operators would. With a fresh load of soil in the bucket, he would approach perpendicular to the wall. He would then dump the load above the wall, and back-drag the soil with the bucket of the loader to the top of the work area. It appears he continued this method until reaching the end of the work area. The victim had depleted the load of top-soil from which he had been spreading. Though it is unclear what his intentions were prior to the incident, he turned the loader backward, judging from the tread marks left behind and started backward along the curbing of the work area. He then proceeded to back toward and then over the wall. With the wall being at an approximate 45 degree angle from the curb he was paralleling, he went over the wall at somewhat of an angle. The left rear tire went over first followed by the right rear tire, followed by the front tires and bucket. The loader scraped across the top edge of the wall and the tires left tread marks down the face of the wall. The loader landed on its back on the soil below then rolled to its left side. The victim remained within the confines of the cab, but came out of the operator’s seat and became inverted with his head and chest wedged between the seat and the side protective screen. Though the event was unwitnessed, several persons heard the impact and immediately came to the aid of the victim. The first person to arrive was a construction laborer who was outside the

building and the was second person was a construction manager for the project. The owner of the company was walking toward the front of the building to watch for a new load of top soil when the incident occurred. He immediately went to the aid of the victim. The victim was found lifeless in the cab of the loader and emergency personnel were called to the scene. Emergency personnel could not find a pulse or heart activity. The medical examiner's office was contacted and the victim was pronounced dead at the scene.

CAUSE OF DEATH:

The Certificate of Death lists the immediate cause as asphyxiation due to occlusion of the airway.

RECOMMENDATION/DISCUSSION:

RECOMMENDATION #1: **Ensure that all operators of heavy equipment wear seat belts while operating equipment equipped with approved roll-over protective structures.**

DISCUSSION: Employers should ensure that seat belts are used during the operation of heavy equipment. Seat belts on the skid-steer loaders and other heavy equipment are incorporated into the design of the rollover protective structure (ROPS). They are designed 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 equipment roll over. Failure to use seat belts in association with ROPS has proven to be hazardous to equipment operators during a rollover. Many times the victim is thrown from the operators seat and into the path of the overturning equipment and protective structure.

RECOMMENDATION #2: **Ensure that all interlock safety devices are functional and in good working condition before any operation of the vehicle.**

DISCUSSION: Interlocking safety devices are installed to prevent the injury and death of heavy equipment operators. Numerous serious injuries or fatal incidents could have been prevented had such devices not been bypassed or altered. Research has proven that the bypassing and altering of any safety device can inevitably end in a serious injury or fatality incident.

RECOMMENDATION #3: 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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DISSEMINATION LIST

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Mine Safety and Health Administration
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Missouri Department of Elementary & Secondary Education
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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Safety Council of Greater St. Louis
Safety Council of the Ozarks
Shelter Insurance Companies
St. Joseph Safety Council
St. Louis City Medical Examiner Office
St. Louis County Department of Community Health
St. Louis County Medical Examiner Office
The Educational Center on Family Violence
University of Missouri, Agricultural Engineering