

A forklift shop technician for a dealer who services, sells, and rents material handling equipment, in Texas, died when the carriage of a forklift fell and one of the fork's tines crushed his chest.

Investigation # 99TX23101

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SUMMARY

On May 8, 1999, a 58 year-old male forklift shop technician (the victim) died when the carriage of a forklift he was working on fell and one of the forks struck him in the chest. The victim was repacking the lifting cylinder which raises and lowers the mast. The victim used his own chain to secure the intermediate rail and carriage in a raised position. He removed the lifting cylinder while lying beneath the mast/carriage and the chain broke. The carriage fell and a fork crushed the victim's chest.

The TX FACE investigator concluded that to reduce the likelihood of similar occurrences, employers should:

- * Develop a written program which establishes the standards for the types, testing, inspection, and maintenance of equipment, tools and chains used by employees*
- * Provide training on safety issues including written safety procedures and programs to employees when hired and on a regularly scheduled basis*
- * Review and revise (if necessary) all programs on a consistent and scheduled basis, at least annually, and when new procedures or equipment are introduced into the workplace.*
- * Maintain records on all inspections, training, and testing.*

INTRODUCTION

On May 8, 1999, a 58-year-old male forklift shop technician (the victim) died when the forks of a forklift he was working on fell and struck him in the chest. The TX FACE program officer was made aware of the incident by the regional OSHA office on June 8, 1998. A visit to the site by the TX FACE program officer was made on April 15, 1999. The Vice President/Chief Operating Officer was interviewed. A fire/EMS report, police report, and autopsy report were obtained.

The employer was an equipment dealer who services, sells and rents material handling equipment. The company employed 100 workers, 20 of whom performed the same duties as the victim. The employer had been in business for 20 years. There were ten other workers in the shop at the time of the incident, however, no one visually witnessed the event.

The employer's safety program was managed by a designated safety director. A written safety program was in place. It included repair manuals that described safe work procedures. The manuals described the safe method to perform the task of removing the lifting cylinder. Safety meetings were supposed to be conducted monthly though some employees said meetings had not been held for three to four months.

New hire training consisted of assigning the new employee to an experienced worker who was responsible for training. Refresher training consisted of subjects such as hazard communications, vehicle operations, etc. They had a written generic lockout/tagout program but it did not include procedures when repairing the material handling equipment. Therefore, the service mechanics had not received company training on lockout/tagout. The service mechanics were to rely on their former training and on information from service manuals for safety procedures. Any formal training was conducted in a company classroom.

The victim had been employed with the company for nine years and had over 30 years experience working on this type of equipment. He was trained on repairing forklift masts and transmissions by his previous employer, who manufactured the type of mast he was working on when the incident occurred.

The company conducted pre-employment physicals and drug screening.

This was the first fatality experienced by the employer.

INVESTIGATION

The forklift involved was a Hyster-Challenger 30 which had a lifting capability of 5,000 lbs. The forklift was equipped with a triple-staged mast. The triple-staged mast was made up of two intermediate rails each weighing approximately 300 lbs., a carriage weighing approximately 200 lbs., and forks weighing 40-50 lbs. each

The victim was in the process of repacking the lift cylinder on a forklift. The lift cylinder had to be removed by securing the mast in a raised position. Recommended procedures in several maintenance manuals described how the two intermediate rails should be lifted to a point where their horizontal cross-members are in alignment with the horizontal cross-member of the outer weldment. (Note: the outer weldment remains in a fixed position and the intermediate rails are raised and lowered primarily by the lifting cylinder.) A chain is then wrapped around all three cross-members. The intermediate rails must then be lowered until tension is placed on the chain. Another chain must be installed between the top or bottom cross-member and the carriage.

The victim used an overhead crane to raise the intermediate rails so they lined up with the outer weldment. He then used his own 5/16 inch chain to secure the intermediate rails in a raised position. The chain was wrapped around the cross-members of the intermediate rails and the roll cage. No other chain was used as recommended in the manuals. The victim lowered the overhead hoist supporting the intermediate rails. He disconnected it and disconnected the hydraulic lines to the lift cylinder. He was lying down with his head facing the forklift and reaching underneath to loosen the bottom nut on the lift cylinder. The chain broke and the

intermediate rails with the attached carriage and forks fell. One of the fork's tines struck and crushed the victim's chest.

Co-workers had heard the carriage slam down and immediately attempted to raise the carriage off the victim's chest. They first tried to use a hydraulic jack, which was unsuccessful, and then used the overhead hoist which lifted the equipment off the victim's chest.

Emergency medical services (EMS) were notified and responded at 11:35AM. The victim was transported to a local hospital where he was pronounced dead on arrival (DOA).

CAUSE OF DEATH

The medical examiner concluded that the cause of death was the result of a crushed chest..

RECOMMENDATIONS/DISCUSSION

Recommendation #1 - A written program should be developed and implemented which establishes the standards for the types, testing, inspection, and maintenance of equipment, tools, and chains used by employees

Discussion: The 5/16 inch chain which broke was owned and used only by the victim. Testing and an inspection of the chain was done after the incident. It appeared that the damage to the chain was indicative of overload failure and of overuse..

Except for unique and large equipment provided by the employer. employees purchased and used their own tools and equipment to repair and maintain the material handling equipment. There were no guidelines or standards for the types of tools, including chains, that were used. There were no required and scheduled integrity tests, inspections, nor preventive maintenance. If the employer purchases and provides the equipment, care should be taken to make sure the tools, chains, and equipment are appropriate and safe for the tasks. If the employer is not going to provide all tools, chains, and equipment, guidelines and standards should be set which require the employee to only buy and use the tools, chains, and equipment which can be used to safely perform the jobs. In either case, written procedures should be established which require scheduled testing, inspections, and preventive maintenance of the tools, chains, and equipment with documentation to record these actions.

Recommendation #2 - When hired and on a regularly scheduled basis, employees should receive training on safety issues including written safety procedures and programs

Discussion: Interviewed employees stated that there was no regular safety training and most had not received new employee orientation on the safety programs and procedures of the company. The company relied on an employee's prior experience and training and on training on the job provided by an experienced employee. Unfortunately, these practices may reinforce unsafe behavior. Formal, structured training should be required for all employees on the programs and procedures that are relevant to their duties.

Also, the company had a written lockout/tagout program but there were no specific instructions for energy-arresting procedures for material handling equipment. Energy evaluations and job safety analyses will assist in identifying those activities which require written procedures to prevent injury exposures.

Recommendation #3 - All safety programs should be reviewed and, if necessary, revised on a consistent and scheduled basis, at least annually, and when new procedures or equipment are introduced into the workplace.

Programs and procedures may become outdated and/or new equipment and activities may have been implemented. Safety protocols should be addressed. A company's overall safety program and specific procedures should be reviewed for relevancy at least annually and when any new equipment or operations are introduced into the workplace. These reviews should be documented and employees trained on any revisions.

Recommendation #4 - Records should be maintained on all inspections, training, testing, and preventive maintenance.

Records are a tool to analyze the effectiveness of a company's safety program and to identify those areas which may need improvement or change.

An inspection checklist should be used to conduct scheduled and consistent inspections of the facilities, tools, and equipment. The checklists should indicate any corrective actions that need to be accomplished, what persons are responsible for implementing the actions, and when the problems were resolved.

Training records should specify the date of training, topic, presenter, and attendees. These can be used to check to see who has and has not received the training, and used to evaluate the effectiveness of the training. When accidents/incidents are investigated, looking at the causes and comparing them with the training provided may indicate a need to provide additional or improved training.

Testing records on equipment and tools will be in conjunction with the preventive maintenance records. Preventive maintenance and testing on equipment should be on a regular and consistent schedule. Testing may identify a need to have maintenance on some tools and equipment before the tools and equipment are scheduled.