

NJ FACE INVESTIGATION REPORT



Fatality Assessment & Control Evaluation Project

FACE 12-NJ-010

August 20, 2013

Hispanic Laborer Crushed Between Lift Arms and Frame of Skid-steer Loader

A 34-year-old Hispanic male laborer at a snow removal company died after being crushed between the lift arms and the chassis of a small skid-steer loader at a maintenance/storage yard. On the day of the incident, the decedent was attempting to repair the pedal of the skid-steer loader that controls the raising and lowering of the lift arms. In order to access the pedal for repairs, the victim attached a three-ton overhead chain hoist to the skid-steer loader to lift the bucket. As he was repairing the pedal, the bucket/lift arms came free of the hoist, dropped down, and crushed the victim.

Contributing Factors

- Overhead hazard, not using lift-arm stops
- Working alone

NJ FACE investigators recommend that these safety guidelines be followed to prevent similar incidents:

- **When maintenance is performed on a skid-steer loader and the bucket needs to be raised, lift-arm support devices must be in place.**
- **Do not work alone when conducting tasks in potentially hazardous situations.**
- **Employers should ensure that all equipment be in sound operating condition; maintenance on heavy machinery should be conducted by a well-trained, qualified person.**
- **A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.**



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INTRODUCTION

In winter of 2012, NJ FACE staff was notified of the death of a 34-year-old Hispanic male who was crushed underneath the bucket mechanism of a small-skid steer loader at a storage and maintenance yard in Northern NJ. The victim had worked for this small snow-removal company for approximately eight years. Previous to this job, the victim worked for a landscaping company and had operated and performed maintenance on skid-steer loaders. Job training and general health and safety instruction was conducted on site by the employer.

A NJ FACE investigator contacted the OSHA Area Office and conducted the investigation. Additional information was obtained from the medical examiner's report, death certificate, OSHA, and the news.

INVESTIGATION

The incident occurred on a mild winter evening (approximately 35°F at the time of the incident), and took place at a garage and storage area for a company that performs snow removal. The garage consisted of two garage bays with roll up doors and an exit door on the building's side. The incident took place in the largest section of the garage, in the maintenance area (see Figure 1). The owner of the company had come to the site the day before the incident, was working outside the building and attempted to lift the bucket using the pedal (which operates the lift arms) in the cab. The bucket did not lift by use of the pedal, so he assigned the deceased with the job of fixing the pedal. As the victim was very familiar with all the machines on site and was the company's sole mechanic, he decided to come back later and attempt to fix the pedal. According to onsite interviews by OSHA, the victim had worked on the machine several times before. On these occasions, to raise the bucket, the employee wrapped a chain around the bucket and attached it to a hook connected to a 3-ton overhead hoist.

The victim returned alone to the garage later that evening to fix the pedal. There were no witnesses to the incident. The next day, the owner had received several calls from the victim's wife, who said that he had not returned home from work. The owner went to the site as soon as possible and found the victim crushed between the lift arms and the body of the skid-steer loader.

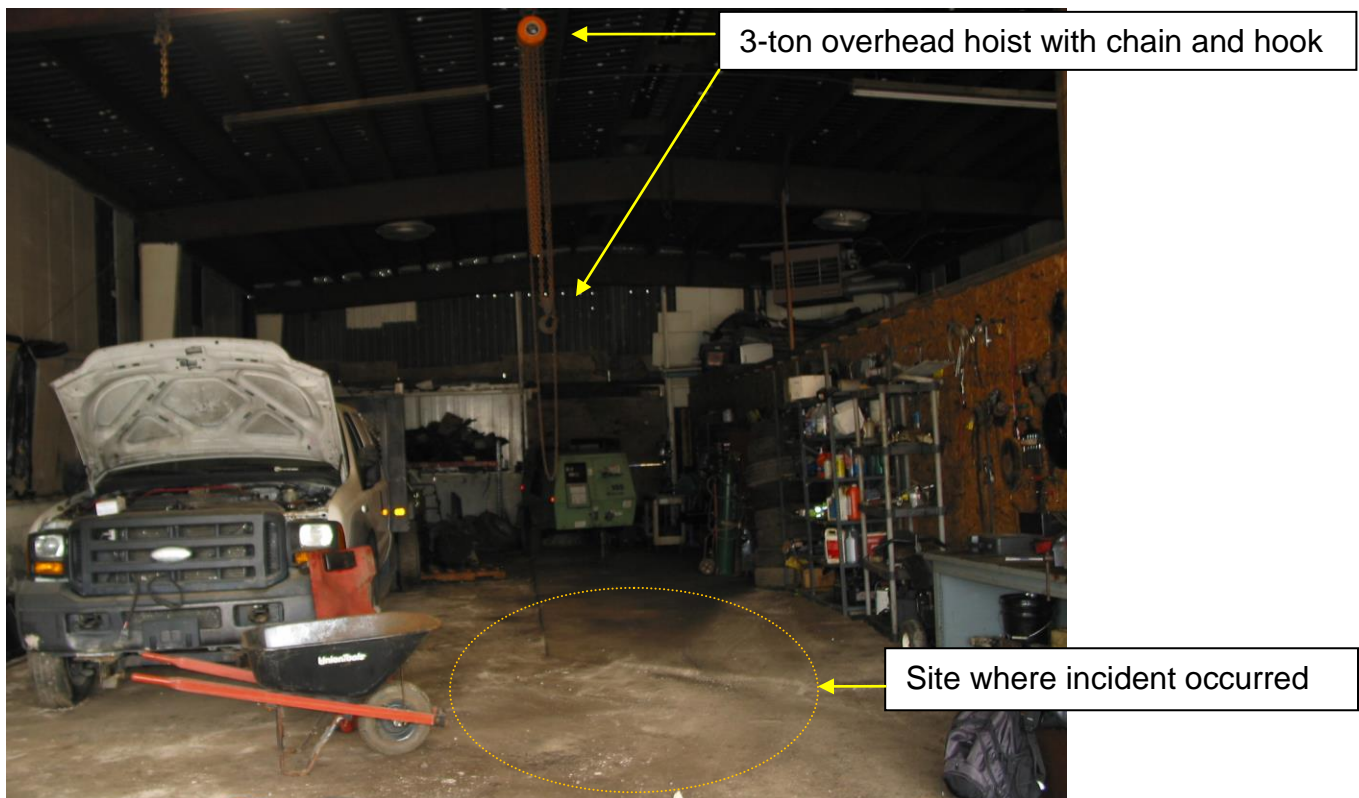
Based on the investigation by NJ FACE, OSHA, and a safety engineer from the manufacturer of the skid-steer loader, the machine was not running at the time of the incident. There was gasoline left in the

engine when the emergency personnel arrived and a tow truck driver was able to drive the machine out of the garage. Had the machine been running all night, there would have been no gasoline left in the tank. In addition, during the investigation conducted by the safety engineer, since the pedal was damaged, the only way the safety engineer could lift the bucket with the machine running was by using a pry bar on a linkage behind the pedal. There was no bar of this kind found anywhere near the victim when the victim was discovered. It was therefore concluded that the bucket was raised via the overhead three-ton, hand-operated chain hoist (Figure 1). However, no chains were found wrapped around the bucket or anywhere on the ground at the site. It was deduced that the hook was connected directly to the bucket.

Since the engine had not been running during the incident, there would be no hydraulic fluid running through the cylinders (which, according to the safety engineer, would cause the arms to quickly slam down through cavitation). In addition, no lift-arm supports were in place at the time of the incident.

FIGURE 1. Incident site; inside and outside views of garage.

a. Inside view of the garage.



a. Outside of garage.



FIGURE 2: Skid-steer loader involved in incident.



Lift arms down when victim was found

Pedal victim was attempting to fix

Victim found here, facing cab, under lift-arm frame and crossbar

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: When maintenance is performed on a skid-steer loader and the bucket needs to be raised, lift-arm support devices must be in place.

Discussion:

Working under a raised bucket can be very hazardous. However, the use of appropriate lift-arm supports can protect a worker at risk. There are two common types of lift arm supports; pin-type or strut type, which should be provided or purchased from the manufacturer. Currently, most manufacturers include lift-arm supports as standard when purchasing a skid-steer loader, but this was not always the case. It is unknown whether or not arm supports were included at the time of purchasing this loader in 1985. In this incident, lift-arm supports were not in place after the victim lifted the bucket using the three-ton overhead hoist. A helpful resource is the NIOSH Alert entitled, *Preventing Injuries and Deaths from Skid-Steer Loaders*.¹ This publication not only outlines critical safety considerations, but provides real case studies of fatalities.

Recommendation #2: Do not work alone when conducting tasks in potentially hazardous situations.

Discussion:

The victim was working alone on the night of the incident. It would have been beneficial for a coworker to have assisted in the maintenance operation on the skid-steer loader. Perhaps another worker, properly trained, may have discouraged the victim from using the three-ton hoist as a way to lift the bucket, may have recognized the need for lift-arm supports, and may have reacted to help the victim when the hook-bucket connection became unstable.

Recommendation #3: Employers should ensure that all equipment be in sound operating condition; maintenance on heavy machinery should be conducted by a well-trained, qualified person.

Discussion: In this case, the condition of the pedal that raises and lowers the bucket was in poor condition. The machine and its safety devices should be regularly inspected and maintained, including but not limited to the following: control interlocks, seat belts, restraint bars, side screens, rollover protection systems.¹

In addition, all maintenance should be performed following manufacturer's instructions and conducted by trained, qualified persons. The training should be specific to the potential hazards involved. In this case as is stated training should be given regarding lockout/tag out and the control of hazardous energy.²

Recommendation #4: A safety and health plan based on a job hazard analysis should be developed by the employer and followed where workers are assigned tasks.

Discussion: Employers should conduct a job hazard analysis, with the participation of employees, of all work areas and job tasks.³ A job hazard analysis should begin by reviewing the work activities for which the employee is responsible and the equipment that is needed. Each task is further examined for mechanical, electrical, chemical, or any other hazard the worker may encounter.

A source of information on conducting a job hazard analysis is included in the Appendix.

APPENDIX

RECOMMENDED RESOURCES

It is essential that employers obtain accurate information on health, safety, and applicable OSHA standards. NJ FACE recommends the following sources of information which can help both employers and employees:

U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)

Federal OSHA can provide information on safety and health standards on request. OSHA has several offices in New Jersey that cover the following counties:

- ☎ Hunterdon, Middlesex, Somerset, Union, and Warren counties.....732-750-3270
- ☎ Essex, Hudson, Morris, and Sussex counties.....973-263-1003
- ☎ Bergen and Passaic counties.....201-288-1700
- ☎ Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester,
Mercer, Monmouth, Ocean, and Salem counties.....856-757-5181

🖥 Web site: www.osha.gov

New Jersey Public Employees Occupational Safety and Health (PEOSH) Program

The PEOSH Act covers all NJ state, county, and municipal employees. Two state departments administer the Act; the NJ Department of Labor and Workforce Development (NJDLWD), which investigates safety hazards, and the NJ Department of Health (NJDOH) which investigates health hazards. PEOSH has information that may also benefit private employers.

NJDLWD, Office of Public Employees Safety

☎ Telephone: 609-633-3896

🖥 Web site: www.nj.gov/labor/lsse/lspeosh.html

NJDOH, Public Employees Occupational Safety & Health Program

☎ Telephone: 609-984-1863

🖥 Web site: www.nj.gov/health/peosh

On-site Consultation for Public Employers

☎ Telephone: 609-984-1863 (health) or 609-633-2587 (safety)

🖥 Web site: www.state.nj.us/health/eoh/peoshweb/peoshcon.htm

New Jersey Department of Labor and Workforce Development, Occupational Safety and Health On-Site Consultation Program

This program provides free advice to private businesses on improving safety and health in the workplace and complying with OSHA standards.

☎ Telephone: 609-984-0785

💻 Web site: www.nj.gov/labor/lsse/lsonsite.html

New Jersey State Safety Council

The New Jersey State Safety Council provides a variety of courses on work-related safety. There is a charge for the seminars.

☎ Telephone: 908-272-7712.

💻 Web site: www.njsafety.org

Internet Resources

Other useful Internet sites for occupational safety and health information:

- CDC/NIOSH - www.cdc.gov/niosh
- USDOL Employment Laws Assistance for Workers and Small Businesses - www.dol.gov/elaws
- National Safety Council - www.nsc.org
- NJDOH FACE reports - www.nj.gov/health/surv/face/index.shtml
- CDC/NIOSH FACE - www.cdc.gov/niosh/face/faceweb.html
- OSHA - www.osha.gov
- ANSI - www.ansi.org

REFERENCES

1. NIOSH Alert: Preventing Injuries and Deaths from Skid-Steer Loaders. December 2010. Department of Health and Senior Services (NIOSH) Publication Number 2011-128.
2. CFR 1910.147; *The control of hazardous energy (lockout/tagout)*, including but not limited to section C(7)(i): *Training and communication*.
3. *Job Hazard Analysis*. US Department of Labor Publication # OSHA-3071, 1998 (revised). USDOL, OSHA Publications, PO Box 37535, Washington DC 20013-7535

Fatality Assessment and Control Evaluation (FACE) Project
Investigation # 12-NJ-10

This report was prepared by staff members of the New Jersey Department of Health's Occupational Health Surveillance Unit. The goal of FACE is to prevent fatal work-related injuries by studying the work environment, the worker, the task, the tools the worker was using, the energy exchange resulting in the fatal injury, and the role of management in controlling how these factors interact. FACE gathers information from multiple sources that may include interviews of employers, workers, and other investigators; examination of the fatality site and related equipment; and reviewing OSHA, police, and medical examiner reports, employer safety procedures, and training plans. The FACE program does not determine fault or place blame on employers or individual workers. Findings are summarized in narrative investigation reports that include recommendations for preventing similar events. All names and other identifiers are removed from FACE reports and other data to protect the confidentiality of those who participate in the program.

NIOSH-funded state-based FACE Programs include: California, Iowa, Kentucky, Massachusetts, Michigan, New Jersey, New York, Oregon, and Washington. Please visit the NJ FACE Web site at www.nj.gov/health/surv/face/index.shtml or the CDC/NIOSH FACE Web site at www.cdc.gov/niosh/face/faceweb.html for more information.

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