MIFACE INVESTIGATION REPORT #13MI043

SUBJECT: Truck Driver Crushed By Roll Off Scrap Metal Box During Unloading From Truck

Summary

In the spring of 2013, a male truck driver in his 30s died when he was crushed by an empty 40 yard, 5 ton scrap metal box from a tilt frame semi-trailer he was unloading. The wire rope used to load and unload the box was not attached to the box and was rewound on the winch spool and attached to the securing C hook on the trailer. This was an unwitnessed incident. The decedent's sunglasses were found under the box. It is hypothesized that his sunglasses fell under the box and that he may have been reaching under the box to retrieve his sunglasses while it was still resting on the tilt frame end (stinger). While reaching under the box, the box came off the stinger and landed on top of him. The decedent was found by a fellow employee operating a front end loader. After getting help, the loader operator attached chains to the bucket and lifted the box from the decedent as his coworkers moved the decedent from under the container. Emergency response arrived and he was declared dead at the scene.

Figure 1. Overview of incident scene in company yard.

Contributing factors to this incident include:

- Standard operating procedures not followed (unhooked the wire rope prior to complete unloading of the container).
- Reaching under container with no secondary support.

RECOMMENDATIONS

- The company should review and update their Safety Operation Manual for Roll off Trailers to incorporate current operation information provided in the Benlee Operations Manual.
- The company should conduct periodic unannounced workplace inspections to ensure compliance with company safe operating procedures for container loading and unloading.

- The company should establish a health and safety committee as part of their safety program.
- The company should ensure employees conduct thorough pre- and post-vehicle inspections and promptly notify appropriate personnel so required maintenance may be performed.
- The manufacturer should develop and provide a safety label to be applied near the trailer operator controls to remind operators to never unhook the cable from the container until the container is completely on the ground.

INTRODUCTION

In the spring of 2013, a male truck driver in his 30s died when he was crushed by an empty 40 yard, 5 ton scrap metal box from a Benlee Dunright tilt frame semi-trailer he was unloading from his truck. MIFACE learned of this incident from the MIOSHA 24-hour ASAP notification. The MIFACE researcher contacted the decedent's employer who agreed to participate with the MIFACE program. The MIFACE researcher spoke with and was accompanied by the firm's operation manager, in the firm's yard to look at a truck and scrap metal container that were similar to the ones the decedent was using and to observe how to load and unload a container from the truck.

The firm was a specialty scrap metal hauler that used tilt frame trucks and trailers and roll off scrap boxes. The firm has been in business for 16 years, employing 25 individuals, 12 of whom were truck drivers. The firm had been at its current location for 12 years. The decedent's job title was roll-off truck driver. He worked full time and worked as many hours per day as necessary to complete his route, but no more than five 10-hour days per week, including Saturdays. His shift began at 6:30 a.m. on the day of the incident. He had worked for the firm for five years. The operations manager stated that the decedent had 18 years of experience driving for a total of 3 different roll off companies and had been trained at all 3 companies. ANSI-compliant safety sunglasses (when needed) and high-visibility safety vests were required personal protective equipment. The firm did not have a written health and safety program, but did have a circa 1998 written safety operation manual for roll-off trailers. The firm did not have a health and safety committee. The operations manager indicated that employees were "written up" for not following the verbal safety instructions, but that there was no written disciplinary procedure.

Employee safety training was provided by the employer. No training records were maintained. New employees received the written operation manual for roll-off containers. Experienced workers rode with the new employee for three weeks. For the first week, the new employee would accompany the experienced employee. For the next two weeks, the experienced employee accompanied the new employee as the new employee conducted their tasks, to provide direction, confirmation of understanding of the procedures, answer question, etc. If after three weeks, the new employee demonstrated competence in all tasks, he/she could work alone.

All truck drivers were required to have a valid commercial driver's license (CDL). Drivers were required to perform pre- and post- trip inspections using a Driver's Vehicle Inspection Report sheet provided by the firm.

Firm Remediation post incident:

- The firm now holds safety meetings every two weeks at the end of the workday.
- The firm developed a written safety program.
- The firm developed a safety label to apply near the operator controls to remind workers to not unhook the cable from the container until it was completely on the ground. See Figure 2.

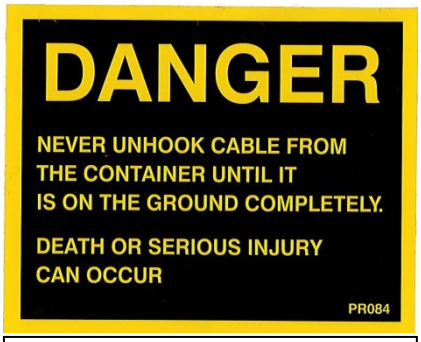

Figure 2. Company-developed safety label.

The MIOSHA General Industry Safety and Health Division issued the alleged Serious citation to the employer at the conclusion of its investigation:

SERIOUS: GENERAL PROVISIONS, PART 1, RULE 11(a)

Training was not provided to each newly assigned employee regarding the operating procedures, hazards, and/or safeguards of the job.

Inadequate training – firm has not audited employees during scrap metal roll off container operations to ensure that employees are following company and trailer manufacturers guidelines for the proper unloadment of roll off scrap boxes.

INVESTIGATION

The decedent's employer transported boxes owned by a separate company to and from client companies to dispose of and salvage metal scrap from press companies and metal fabrication companies. The firm owned the tractors and tilt frame trailers and flatbed trucks.

Equipment

The trailer involved in the incident was a 1996 Benlee Dunright 7 axle tilt frame semi-trailer. Operating controls for the trailer were located outside the tractor.

The container involved in the incident was an empty 40 yard, 5 ton scrap metal box. The container empty weight was 10,000 pounds. The container dimensions were 9 feet 2 inches wide by 15 feet long by 7 feet tall. The container was constructed of welded metal plating sitting on a frame of welded metal. The box had a hinged door at the rear that was secured with chain and clamp latches. At the base of the front of the container was the "doghouse" where the wire rope's hook was attached. The box rested on two rails that ran the length of the box and were 8 inches

tall and 15 feet long. The rails were each 26 inches from their respective side of the box. There were 4 rollers attached to the box, two on the front and two at the rear. The front rollers were 33 inches from the front of the box and the rear rollers were approximately 12 inches from the rear of the box.

Container Unloading Procedure

To unload the container, the driver placed the trailer at the desired location, set the tractor brakes, placed the tractor in neutral, exited the cab, and locked the trailer brakes. The driver unhooked the securement straps from the container. The driver then reentered the cab and engaged the PTO, unlocked the tractor brakes, and exited the cab. At the outside control panel, the driver raised the tilt frame while unloading the wire rope until the rear of the trailer and/or the stinger and the rear of the box was on the ground. The driver then released the trailer brakes via a "flipper" brake lever next to the hydraulic levers at the control panel to unload the box to the ground while the truck/trailer "walked" away from the container. The tilt frame and/or stinger tail must be on the ground prior to the front wheels of the box. When the box was totally on the ground, the driver set the trailer brakes using the flipper lever, unloaded the wire rope to create slack, detached the D ring from the box, attached the D ring to the C hook on the tilt trailer and took up the slack to ensure the wire rope was taut. The driver then lowered the tilt trailer bed band and secured the PTO. The tilt trailer achieved as much as a 60-degree tilt during this maneuver as needed to unload the box. If a box was unhooked before it was on the ground, the box can fall off, the box can roll away, or the truck can roll away and become a runaway as the brakes were off.

The Incident

The incident occurred in the North yard, which was a dirt lot used to store empty containers. It was very muddy with multiple water puddles from a heavy rain that occurred overnight and through the early morning hours. It was not raining at the time of the incident.

Figure 3. View of truck/trailer from near container and decedent's location. Note that stinger is not fully on the ground.

The decedent was observed on security camera entering the company grounds at approximately 8:45 a.m. The immediate events surrounding the death were unwitnessed. At approximately 8:55 a.m. a coworker driving a front end loader saw the decedent's raised trailer and drove his front end loader to the decedent's location to ask him a

question. When his coworker arrived at the location, he observed the tilt frame fully extended, the stinger almost touching the ground (but not under the container), the container off the trailer and fully resting on the ground, and the decedent under the box See Figure 3 for the location of the stinger in relation to the ground. The front end loader driver ran back to the shop to get help and have someone call 911.

Figure 4. Sunglasses location found under container.

The front end loader driver and two coworkers went back to the incident location. The workers found that the wire rope used to load and unload the container was not attached to the container. The front end loader driver instructed his coworkers to move the truck and trailer while he attached the loader chain to the box to lift it up off of the decedent.

One coworker attached the wire rope to the trailer and made it taut and then entered the tractor cab. In the cab, he noted that the PTO was engaged, the truck was in neutral and the brakes were not set. After the box was raised by the front end loader, the two coworkers moved the decedent. The decedent was located just forward of the left front roller, laying on his right side, almost face down, with his left arm free and left hand touching the left front side of the box. The workers checked for a pulse but did not find one. EMS arrived shortly thereafter and the decedent was declared dead.

Figure 5. Fresh gouge mark on the driver's side trailer bed rail.

When the container was raised, the decedent's unfolded sunglasses were found under the box (See Figure 4). A fresh gouge mark was noted on the driver's side trailer bed rail (See Figure 5). Presumed scenario: Contrary to company procedure, the decedent did not fully deploy the container to the ground prior to releasing the wire rope. While the container was still on the stinger/trailer tilt frame, his sunglasses fell out of his pocket. He may have been reaching under the container to retrieve his sunglasses when the container fell from the trailer tilt frame, pinning him against the ground.

Employees interviewed by MIOSHA stated that all employees were instructed to: not to reach under a box that was not fully on the ground for any

reason, the wire rope is not to be disconnected from the box until it is fully on the ground, and it is against company policy to do both of those actions.

Employees indicated that there was no advantage to remove the wire rope before the container is on the ground. One employee indicated that while unusual, it is possible for the box to shift off the stinger due to the muddy ground.

Employees are allowed to work under a box with appropriate blocking and cribbing if the box has to be raised and only if the box is in the shop on the concrete surface.

The responding police department conducted a Level One exam on the truck and tilt trailer and found the following deficiencies:

- Axle positioning parts defective/missing/axle 2, right side, loose U-bolt (393.207a).
- Insufficient brake linings/Lining thickness less than ¼" (393.47d).
- Brakes out of service: The number of defective brakes is equal to or greater than 20% of the service (396.3(a)(1).

The MIOSHA compliance officer investigating the incident examined the trailer and wire rope and did not observe damage to trailer or rope. The trailer controls could not be operated as the trailer was in the shop and not connected to power. The wire rope was free of defects and was within tolerance for broken strands (4 total found in a 10 foot section). There were no reported issues with the tilt controls, the wire rope, the PTO or the winch.

CAUSE OF DEATH

The cause of death as listed on the death certificate was traumatic asphyxia. Toxicology results on autopsy showed no illegal, prescription or over the counter drugs.

RECOMMENDATIONS/DISCUSSION

- The company should review and update their Safety Operation Manual for Roll off Trailers to incorporate current operation information provided in the Benlee Operations Manual.

Although the firm's 1998 manual has a significant amount of similar information to the Benlee most current Benlee Operation and Service Manual (http://www.benlee.com/benlee-operations-manuals.html) online manual, there is information in the online Benlee manual in the General Operating Information: Operating Sequence that is not included in the firm's manual. MIFACE recommends that the firm compare the two manuals and update their manual accordingly.

- Employers should conduct periodic unannounced workplace inspections to ensure compliance with company safe operating procedures for container loading and unloading.

The firm had conducted employee training regarding the loading and unloading of the containers, but did not conduct periodic unannounced workplace inspections to ensure compliance with their safe operating procedures. Conducting a periodic unannounced safety inspection, both at the company site and at client sites, can reveal if operators are following company-required safe work practices and provides management an opportunity to determine if training is effective and to re-instruct workers regarding safe work practices.

- Employers should establish a health and safety committee as part of their safety program.

The MIOSHA Consultation, Education and Training (CET) Division's website has resources to assist employers establish and maintain an effective health and safety management system. An integral component of an effective health and safety management system is an effective health and safety committee. A Health and Safety Committee comprised of management and employees provides a forum to regularly discuss health and safety issues in the workplace. The Committee is an important way for employees to help manage their own health and safety and assist their employer in providing a safer, healthier workplace. The formation of the Committee provides a process for open communication on health and safety issues and enhances the ability of employees and management to resolve safety and health concerns reasonably and cooperatively.

The MIOSHA CET division webpage – MIOSHA Health and Safety Toolbox – contains ideas, activities, and materials that focus on the major components of a safety and health system. Please click on the following link for the MIOSHA Health and Safety Toolbox materials: http://michigan.gov/lara/0,4601,7-154-61256_11407_15317-124535--,00.html.

- Employers should ensure employees conduct thorough pre- and post-vehicle inspections and promptly notify appropriate personnel so required maintenance may be performed.

Although not contributory to the death, the Level One Department of Transportation (DOT) inspection of the truck/trailer found deficiencies with the brakes (worn brakes and automatic brake drums) and axle positioning device. The pre-and post-inspections performed by the drivers apparently did not identify/flag these deficiencies so the firm's maintenance shop could initiate repairs in a timely manner. MIFACE recommends that the employer re-train the drivers in the importance of and how to conduct a thorough pre- and post-trip inspection and ensure, through unannounced spot checks, that the employees are following company procedure.

- The manufacturer should develop and provide a safety label to be applied near the trailer operator controls to remind operators to never unhook the cable from the container until the container is completely on the ground.

In addition to the existing safety reminders, MIFACE recommends that manufacturers develop and apply a safety notice/label near the operator's controls that reminds employees that the cable should not be unhooked until the container is completely on the ground.

Key Words: Rolloff container, Trailer unloading, Struck by, Administrative and Support and Waste Management and Remediation Services

RESOURCES

MIOSHA standards cited in this report may be found at and downloaded from the MIOSHA, Michigan Department of Licensing and Regulatory Affairs (LARA) website at: www.michigan.gov/mioshastandards. MIOSHA standards are available for a fee by writing to: Michigan Department of Licensing and Regulatory Affairs (LARA), MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

- MIOSHA General Industry Safety and Health Division General Provisions, Part 1, Rule 11(A)
- BENLEE Operations Manual. http://www.benlee.com/benlee-operations-manuals.html
- MIOSHA Health and Safety Toolbox: http://michigan.gov/lara/0,4601,7-154-61256_11407_15317-124535--,00.html
- How to Conduct Safety And Health Self-Audits. Workplace Safety Reference Materials. Safety.BLR.com July 31, 2003 http://safety.blr.com/workplace-safety-reference-materials/how-to-guides/safety-administration/safety-compliance-audits/How-to-Conduct-Safety-And-Health-Self-Audits/

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