

Metal Fabrication Shop Owner Dies When Crushed By Falling Steel Plate

Incident Number: 03KY124



Back of shop where steel plate fell on business owner. The crane was used to load and unload materials.

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Kentucky Fatality Assessment and Control Evaluation (FACE) Program

Incident Number: 03KY124

Incident Date: December 13, 2003

Release Date: December 1, 2004

**Subject: Metal Fabrication Shop Owner Dies When
Crushed by Falling Steel Plate**

Summary

On December 15, 2003, a metal fabrication shop owner died when a 4,000 pound steel base plate fell on him. While inside the shop building, the work crew of least three men, including the owner, fabricated a 10'x 20' steel base plate to be used at a water treatment plant. The base plate was to house or serve as a base anchor a large water pump. After welding connectors and channel iron beams to one side of the plate, the crew pushed the plate through a bay door with a forklift to an outside area in back of the shop. The forklift operator used the forks to lift one side of the plate. The owner then crawled headfirst underneath the plate to place blocks underneath the plate. While the owner was underneath the plate, the plate slipped off the forks of the forklift, and the plate fell on the victim. He died at the scene due to multiple blunt force injuries.

To prevent occurrences of similar incidents, the following recommendations have been made:

- Recommendation No. 1: Employers should provide and use adequate procedures and tools to perform jobs safely.
- Recommendation No. 2: Business owners should follow best safety practices.
- Recommendation No. 3: Employers/employees should be properly trained on the use of forklifts.
- Recommendation No. 4: No one should be positioned underneath the elevated load of a forklift.
- Recommendation No. 5: Employers/employees should be trained in the proper methods to secure and lift loads when using a forklift to prevent the load from slipping or moving.
- Recommendation No. 6: Employers should develop written safety procedures for all tasks and provide training for the procedures.

Background

On February 27, 2004, the Kentucky Fatality Assessment Control and Evaluation program became aware of an industrial incident involving a fatality via newspaper surveillance. The coroner was contacted and a site visit was made on March 23, 2004 to the facility. The coroner and the succeeding business owner were interviewed. Photographs were taken of the shop. To

get a better perspective of the steel fabrication industry, another steel fabrication shop owner with over 20 years of experience and a buyer with 10 years of experience were also interviewed for this report.

The victim in this incident owned a metal fabrication business that produced steel plate bases for large motors and pumps. Bases were made of steel and channel iron. Due to space limitations inside the facility, it was common practice to push the large plates outside with a fork truck, flip them over, then push the plates back inside so the other side could be worked on. This procedure was used when pieces required welding or painting.

Three years prior to his death, the victim had purchased the business from a family member who retired. The deceased had worked in the business for the previous owner for several years before purchasing it. Shortly after the victim's death, the business was sold to another relative.

According to the succeeding owner, the decedent performed all of the dangerous tasks himself. Two local students were employed on an as-needed basis and were working the day of the incident. There were no known written safety procedures. Also, there was not a certified competent person employed by the business (including the owner). Employee work hours depended upon contracts and the labor required to meet contract deadlines.

Employment records for the laborers which might have included training records were not available. The laborers performed tasks required to fabricate the special steel bases the company manufactured. These tasks included, but were not limited to: welding, driving motorized material-handling equipment such as forktrucks, and painting and moving pieces of metal from on-site storage locations to the shop.

According to a weather service, the average high air temperature for the week before the incident was 34.6°F high and the high on the day of the incident was 38°F. There was no precipitation on the day of the incident and the month-to-date precipitation was 0.88 inches. It was unlikely that the ground was slick from ice, snow or water that might have caused the steel plate to shift and fall from the forks of the forktruck.

Investigation

A small steel fabrication business was contracted to build a base plate for a water pump that would pump tens of thousands of gallons of water per day. When completed, the 10' x 20' steel plate would weigh approximately 4,000 pounds.

On the day of the incident, the decedent and 2 laborers were fabricating a ½" x 10' x 20' steel metal plate weighing approximately 4,000 pounds. One side of the plate base had been completed with channel iron beams and connectors. One of the laborers operated the forktruck and pushed the plate outside the shop so it could be flipped over and pushed back inside to continue work on the other side of the plate. After pushing the plate outside, the forktruck operator slipped the forks under one side of the plate and tilted the plate with the other side on the ground. The owner then crawled headfirst under the plate to place blocks underneath. As he was positioning the blocks under the plate, the plate slipped off the forks and fell on the victim. One of the laborers immediately called emergency services. The incident occurred at approximately 2:52 pm. Emergency services arrived at the scene within minutes of receiving the

call. Paramedics arrived, assessed the victim and contacted the coroner at 3:13 pm. The coroner arrived at 3:20 pm and declared the victim dead at the scene at 3:30 pm.

Cause of Death

The autopsy report stated the victim died due to multiple blunt force injuries.

Recommendations and Discussions

Recommendation No. 1: Employers should provide and use adequate procedures and tools to perform jobs safely.

An adequate beam and hoist mechanism for flipping over large plates and heavy pieces of metal should have been installed. By using a series of clamps and cables attached to an appropriate beam in the ceiling, the cables could be clamped on to the plates and by using tension on the cables, plates could be turned over or moved in a more controlled manner. Another alternative method for turning over cumbersome material would be to use an overhead crane. Either of these methods would allow for a safer way of handling and moving large pieces of steel and turning them over. Metal plates could be hoisted and turned over without positioning blocks underneath the 4,000 pound plate.

Recommendation No. 2: Business owners should follow best safety practices.

According to KRS 338.031(1)(a), employers are expected to provide employees a safe place to work, free from recognized hazards. This protection includes business owners. Each employer should have safety procedures and policies in place for their employees and themselves to abide by. Employers should follow safe work practices and set good examples of safe work habits for all employees, including young workers. When interviewed, the succeeding owner clarified that the decedent performed all dangerous tasks himself, such as crawling under metal plates.

Recommendation No. 3: Employers/employees should be properly trained on the use of forklifts.

According to KY OSH 1910.178(l)(1)(i), “the employer shall ensure that each forklift operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation” by a person “who has the knowledge, training, and experience to train powered industrial truck operators and evaluate their competence”. It is unknown whether or not the employer or his two part-time employees had undergone formal training on forklift operations and safe operating procedures such as lifting loads.

Recommendation No. 4: No one should be positioned underneath the elevated load of a forklift.

KY OSH 1910.178(m)(2) states that “No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty”. This type of injury could be prevented by adhering to this standard.

Recommendation No. 5: Employers/employees should be trained in the proper methods to secure and lift loads when using a forklift to prevent the load from slipping or moving.

KY OSH 1910.178(o)(1) states, “only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered”. Lifting the edge of a 10’ x 20’ metal plate with forks of a forklift is a dangerous undertaking. This type of task, if necessary to perform, should be performed by an individual trained in the mechanics of picking up a typical heavy load such as this with a forklift.

Recommendation No. 6: Employers should develop written safety procedures for all tasks and train all appropriate personnel on the procedures.

All businesses where workers perform potentially dangerous tasks should perform a job hazard analysis and develop and implement written safety procedures for those tasks. These safety procedures should outline and explain safe practices for each hazardous task. Instructions should include how to perform the task and how to safely operate any equipment required to perform each task.

Keywords

Channel iron
Forklift
Metal fabrication
Steel

Acknowledgements

Consultant
Coroner
Kentucky Occupational Safety and Health Compliance Officer
Metal fabrication buyer
Metal fabrication shop owner
Succeeding business owner

The Kentucky Fatality Assessment & Control Evaluation Program (FACE) is funded by a grant from the Centers for Disease Control and the National Institute of Safety and Health. The purpose of FACE is to aid in the research and prevention of occupational fatalities by evaluating events leading to, during, and after a work related fatality. Recommendations are made to help employers and employees have a safer work environment. For more information about FACE and KIPRC, please visit our website at: www.kiprc.uky.edu



Base plate inside shop before being pushed outside to be turned over. This plate is very similar in configuration to the one which fell on business owner.



An example of how the fork truck was used to lift the metal plate. This plate is similar to the one that fell on the business owner.



An example of the metal base plate which fell on business owner.