

# **Worker Crushed To Death by Falling Steel Coil**

**Incident Number: 05KY015**



Photograph showing coils of slitted steel with boards to be used as chocks.

**Kentucky Fatality Assessment and Control Evaluation Program  
Kentucky Injury Prevention and Research Center  
333 Waller Avenue  
Suite 202  
Lexington, Kentucky 40504  
Phone: 859-323-2981  
Fax: 859-257-3909  
[www.kiprc.uky.edu](http://www.kiprc.uky.edu)**



## **Kentucky Fatality Assessment and Control Evaluation (FACE) Program**

**Incident Number: 05KY015**

**Incident Date: April 13, 2005**

**Release Date: February 21, 2006**

**Subject: Worker Crushed To Death by Falling Steel Coil**

### **Summary**

On April 13, 2005, a 40-year-old male laborer was moving a 5-feet by 9-inch coil of slitted steel, weighing 6600 pounds, when it fell on him. The laborer was in the process of wrapping a chain through the middle of the coil and through a homemade device on the forks of a forklift when the coil tipped over. As the laborer tried to move away from the falling coil, it landed on his left side, breaking his left leg and causing internal injuries. Other workers in the area did not see, but heard the commotion of the falling coil. The plant manager and other workers rushed to aid the laborer who was conscious. They tried to lift the coil of steel off the laborer's leg, but could not. While one of the workers called emergency services, another used a forklift to remove the coil from the laborer's legs. Cognizant and using a cell phone, the laborer spoke to his wife while he was waiting for emergency management service personnel to arrive. Emergency personnel arrived and he told them that he was hurting and to get him to a hospital. The laborer was taken by ambulance to the closest hospital in a neighboring state where he died that same day from internal injuries.

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

Recommendation No. 1: Employers should provide workers with a safe work environment.

Recommendation No. 2: Equipment should only be modified with the manufacturer's approval.

Recommendation No. 3: Coils should be kept from rolling or falling by use of chocking materials.

Recommendation No. 4: An alternative system to transport coils could be implemented.

### **Background**

The manufacturing company the decedent worked for fabricates steel pipes and tubing for indoor sprinkler systems. It started in 1989 and currently employs approximately 20 people. The decedent had been employed by the company for approximately 1 year. His main responsibility was to move coils of steel from one area of the plant floor to another. When not moving steel coils, the decedent filled job vacancies when other workers were off.

Employees were trained to operate the forklift and on-the-job training was provided to each employee on an as-needed basis. Paycheck stuffers were used to distribute safety information.

The average temperature for the area on the day of the incident was approximately 57<sup>0</sup>F.

## **Investigation**

On August 4, 2005, a site visit was made; the plant manager was interviewed and photographs were taken. A police officer who responded to the scene was also interviewed.

Work began at 7:00 AM on the day of the incident. The decedent's job was to move coils of steel from a holding area in the facility to a pipe mill that would turn the steel into a 4-inch diameter pipe. The coils of steel were 9 inches wide, 5 feet high, and weighed approximately 6600 pounds each.

To manufacture pipes, large coils of steel, 42 inches to 48 inches wide, weighing between 33,000 and 44,000 pounds, were put through a slitter. As the steel went through the slitter it was cut into 9-inch-wide widths and coiled into 5 feet high coils. These coils were then transported by forklift from the slitter to a storage area on the factory floor, set down on the 9-inch-wide flat edge of the coil, and leaned against each other in rows. According to the production schedule on the day of the incident, coils were transported by forklift from the storage area to a holding area approximately 40 to 50 feet away, and again set down on the flat edge of the coil and leaned against each other in rows. The holding area was approximately 20 feet from the pipe mill that coiled the steel into pipes. One coil at a time would be transported by forklift from the holding area to the pipe mill as needed.

Coils were transported within the facility by driving the forklift to the front, flat side, of the coil. The driver would then use the forks to set the leaning coil onto its edge and wrap a chain through the hole of the coil. The driver would then slip the chain through a device attached to the forks of the forklift and the coil would then be lifted off the ground and transported to either the storage or holding areas.

To make transporting the coils easier, with approval from management, the employees made a handmade device from chains and attached it to the forks of the forklift. This device was not available for inspection at the time of this interview. The forklift operator would wrap a chain through the hole of the slit steel then attach that chain to the handmade chain device on the forks of the forklift.

At approximately 7:40 AM, 13 employees were working inside the factory and 2 employees were working outside in the factory yard. The decedent drove the forklift to the front of a coil of steel in the holding area and began to prepare the coil for transportation to the pipe mill.

Using the forks of the forklift, he set the coil of steel on its 9 inch flat edge. He then turned off the forklift and leaving the brake in the off position, got off the forklift and began to slide a chain through the hole in the coil of steel. As the decedent was sliding the chain through the hole, the coil of steel began to topple and fall onto him. Realizing his situation, the worker tried to run away from the falling coil of steel. The coil of steel caught the worker on his chest then crushed the worker's left side, breaking his leg. Other workers and the plant manager in the vicinity heard, but did not witness, the coil falling onto the worker. They immediately ran to the worker

and attempted to remove the coil of steel from both his legs. They were not able to move the steel coil so the plant manager instructed another worker to use the forklift to remove the coil of steel from the worker. The injured worker was cognizant at this time. While they were removing the coil of steel off the worker, another laborer went to the nearby office and called emergency services to the facility. Emergency services arrived at 7:52 AM and spoke with the trapped worker who was using a cell phone to talk to his wife. He told emergency workers to hurry up because he was in pain. The worker was transported by ambulance to the nearest hospital in a neighboring state where he died that same day from internal injuries.

### **Cause of Death**

Death was due to internal injuries.

### **Recommendations and Discussions**

Recommendation No. 1: Employers should provide workers with a safe work environment.

According to KRS 338.031(1)(a), employers are to provide each employee with a safe work environment, free from recognized hazards. This includes providing proper equipment for each task and training on how to use the equipment. Training on recognition of hazards and how to abate them should also be provided by the employer. A safe work environment includes workers using equipment with appropriate weight and lift ratings to perform job tasks.

Recommendation No. 2: Equipment should only be modified with the manufacturer's approval.

To accommodate the size of the steel coils, the homemade device was placed at a 36 inch load center instead of the 24 inch load center. The forklift was designed for a 24 inch load center. Placing the device at 36-inches on the forks changed the forklift center of gravity, load distribution, and carrying capacity. This load distribution change and handmade device were not approved by the forklift manufacturer. Equipment had been modified by the workers at the plant to enable them to transport the coils of steel to different locations within the facility. The modifications made to the forklift changed its center of gravity, load distribution, and carrying capacity from the manufacturer's original design. 29 CFR 1910.178(q)(6) prohibits modifications not approved by the manufacturer. Also, 29 CFR 1910.178(o)(2) prohibits handling loads greater than the capacity of the forklift. After the incident, a device, approved by the forklift manufacturer and KY OSH, was purchased which allows a chain to be attached safely to the forks of the forklift.

Recommendation No. 3: Coils should be kept from rolling or falling by use of chocking materials.

Since the incident, procedures on moving and storing steel coils have been changed. Now, coils of steel stacked on edge are chocked and there are boards placed between the coils, whereas previously they were not. This allows the chain to be placed through the middle of the coil without having to sit the coil on its narrow edge, thus reducing the risk of the coil falling over. 29 CFR 1910.176(b) states "for secured storage of materials, they must be stacked, blocked,

chocked or interlocked so that they are stable and secured against movement, sliding or collapse”.

Recommendation No. 4: An alternative coil transport system could be implemented.

Besides a forklift, there are several other material handling methods which could be implemented that would reduce the risk of a coil falling on an employee. One such method would be to use an overhead crane. Another method would be to use an overhead magnetic lifter. A cradle which would support the coil on all sides could be used in conjunction with a forklift.

### **Keywords**

Slitted steel  
Steel coils  
Modified forklift

### **References**

KRS 338.031(1)(a)  
29 CFR 1910.176(b)  
29 CFR 1910.178(q)(6)  
29 CFR 1910.178(o)(2)  
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Plant manager  
Police

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Picture of device workers should have been using with the forklift to transport coils of steel.



Picture of forklift used to transport steel coils. The holding area for the coils is on the other side of the yellow barrier.



Picture of coils of slitted steel in the storage area waiting to be transported to the holding area before being taken to the pipe mill.