STATE OF NEW YORK
DEPARTMENT OF HEALTH

FATALITY **A**SSESSMENT AND **C**ONTROL **E**VALUATION

Contractor Dies in Tractor Overturn while Skidding Logs

Case Report: 02NY055

SUMMARY

On August 14, 2002, a 45-year-old male contractor died from traumatic asphyxia after being crushed in a tractor overturn. The victim had been skidding logs on a farm property for a few months prior to the incident. On the day of the incident, the victim had been dragging a log up an incline when the tractor he was operating overturned to the rear crushing the victim in the operator position. The victim's body was trapped between the ground and the weight of the tractor. The elderly farm owner discovered the victim while walking on the farm lane. The local fire rescue squad and the county sheriff responded but could find no signs of life. Equipment was brought in to remove the tractor from on top of the victim. The coroner was also called to the scene and pronounced the victim dead at the scene.

New York State Fatality Assessment and Control Evaluation (FACE) investigators concluded that to help prevent similar incidents from occurring in the future, contractors performing this type of work should:

- ***Equip all tractors with rollover protective structures (ROPS) in order to protect the operator from injury in the event of a tractor overturn. Seatbelts are an integral part of ROPS protection and should be worn by tractor operators while working.***
- ***Utilize proper hitching and pulling techniques while pulling heavy objects such as logs.***
- ***Evaluate working conditions and utilize properly sized and suitable equipment for pulling heavy objects.***

INTRODUCTION

On September 3, 2002, the New York State FACE (NY FACE) program was notified of an agricultural/logging fatality through a newspaper article. This fatality occurred at a farm location; the farm had contracted with the victim to perform logging activities in the farm woodland. The victim was a 45-year-old male contractor who had been cutting trees and skidding the logs from the woodland to the road for loading. The victim had been working at this location for a few months prior to the incident.

On September 12, 2002, an evaluation was conducted by a NY FACE investigator, who is an agricultural engineer. The county coroner, who was on scene the day of the incident, accompanied the investigator to the incident location. The investigator also visited with the 85-year-old farm owner who discovered the victim on the day of the incident.

The farm on which this fatality occurred had been owned by the same family for over 100 years. At the time of the incident, the 85-year-old farm owner lived by herself on the farm and rented out approximately 150 tillable acres to a neighboring farm. An additional 50 acres of woodland was also present on the farm. The victim had contracted with the farm owners to cut selected trees from this wooded acreage and then drag the logs to the roadway. The logs were then sold to a local sawmill that processed the logs into lumber. The victim had been contracting this type of work for 25 years. The tractor that was involved in the incident was the victim's only tractor. According to relatives, he had used the tractor for many years and was very familiar with its operation.

INVESTIGATION

On Wednesday, August 14, 2002, the contractor came to the farm location at approximately 9:00AM. The elderly farm owner could hear the contractor's tractor dragging logs from the wooded portion of the farm to the loading area near the roadway. The elderly farmer last heard the tractor running at approximately 1:30PM as she fell asleep in the farmhouse. The farmer woke up around 3:15PM and did not hear the tractor running at that time. She thought that this was unusual since the contractor usually worked until 5:00PM each day. The elderly farmer took a walk at approximately 4:00PM along the back farm lane in order to check on the contractor and to see why she did not hear the tractor running.

As the farmer was walking down the farm lane she discovered the tractor overturned to the rear on top of the victim. She called to the victim, got no response, and surmised that he was no longer alive. She returned to the farmhouse and called 911 to report the incident. The local fire rescue squad along with the county sheriff responded to the incident location. Emergency responders could find no signs of life. Equipment was brought in to remove the tractor from on top of the victim. The coroner was also called to the scene and pronounced the victim dead at the scene at 5:03PM.

Prior to the incident, the victim had been dragging an 88-foot hemlock log with a butt diameter of 20 inches behind his 1969 vintage David Brown 990 tractor, an agricultural style tractor weighing approximately 4,600 pounds *(see Photo 1)*. He utilized a logging chain that was wrapped around the butt end of the log and was connected to the back end of the tractor at the upper link of the three-point hitch. This location is well above the axis of the rear axle of the tractor and is not a hitching location. The drawbar hitch is approximately 3 feet below the location of the upper link. Normally, hitching points on this style tractor would be the drawbar or connections to the lower three-point hitch arms. Additionally, the tractor was travelling up a 20-degree incline at the time of the rearward overturn. In addition to the improper hitching technique and the effects of the incline, the mass of the 88-foot log significantly impacted the drag on the tractor. This log was skidding along the ground and it is very likely that the butt end of the log dug into the soil, which anchored the log, and resulted in stopping the tractor. Since the tractor drive wheels were turning with the tractor being anchored from behind, the rotational movement through the axles and wheels resulted

in the tractor rotating backwards around the rear axle, coming to a rest upside down on the victim. Rearward overturns such as this occur in less than one seconds' time thus not allowing the operator sufficient reaction time to avoid the overturn. The victim remained in the operator location during the overturn being pinned underneath the tractor with his knees crushed up against his chest. It is believed that the overturn may have occurred up to one hour before being discovered by the elderly farmer, although it is believed that he died immediately following the overturn.

Photo 1. Actual tractor involved in the incident.

CAUSE OF DEATH

The cause of death was listed on the death certificate as traumatic asphyxia due to or as a consequence of a logging tractor rollover.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: ***Equip all tractors with roll-over protective structures (ROPS) in order to protect the operator from injury in the event of a tractor overturn. Seatbelts are an integral part of ROPS protection and should be worn by tractor operators while working.***

Discussion: The tractor involved in the incident did not have ROPS protection, and while it would not have prevented the overturn in this scenario it may have protected the operator from crushing injuries if so equipped. It is important for tractor operators to wear seatbelts when the tractor is equipped with ROPS in order to keep them in the zone of protection in the operator position in the unlikely event of an overturn.

Recommendation #2: ***Utilize proper hitching and pulling techniques while pulling heavy objects such as logs.***

Discussion: Pulling chains should only be hitched to the frame drawbar or the drawbar on the three-point hitch. It is never recommended to attach chains above the axis of the rear axle as this adversely affects the center of gravity of the tractor and significantly lightens the front end of the tractor during pulling. In this scenario, by attaching the logging chain to the upper link that was above the rear axle, the victim created a downward force at the back end of the tractor. This, in combination with the mass of the log and the incline, contributed to the rear overturn direction. It is recommended that tractor operators "hitch low and pull slow".

Recommendation #3: ***Evaluate working conditions and utilize properly sized and suitable equipment for pulling heavy objects.***

Discussion: Agricultural style tractors are not designed for log skidding operations. Commercial log skidders are designed with a different center of gravity and with a rear mounted cable winching mechanism that can lift the butt end of the log up off the ground during skidding operations. This aids in preventing the log from digging into the ground while skidding. Agricultural tractors have no provisions for this type of lifting during log skidding. According to ground scrape evidence at the scene, it is believed that the log in this scenario dug into the ground while being skidded and effectively anchored the tractor in that location. Additionally, the size of this agricultural tractor was too small for the power and mass requirements needed to safely pull a log of this size. Following this event, a commercial log skidder was brought to the scene to finish the logging operation at this farm.

Keywords: agriculture, tractor, machinery, ROPS

REFERENCES

Roerig S, Casey G, London M, et al. Fatalities associated with improper hitching to farm tractors – New York, 1991-1995. *Morbidity and Mortality Weekly Report* 45(15):307-311, 1996.

KY FACE #97KY029. http://www.cdc.gov/niosh/face/stateface/ky/97ky029.html

The Fatality Assessment and Control Evaluation (FACE) program is one of many workplace health and safety programs administered by the New York State Department of Health (NYS DOH). In cooperation with NIOSH, the NYS DOH FACE program collects information on all occupational fatalities throughout New York State (excluding New York City), evaluates specific types of fatalities, and develops recommendations for prevention of future injuries. These recommendations are distributed to employers, workers, and other organizations interested in promoting workplace safety.

Additional information regarding the New York State FACE program can be obtained from:

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www.health.state.ny.us/nysdoh/face/face.htm