



STATE OF NEW YORK DEPARTMENT OF HEALTH

FATALITY ASSESSMENT AND CONTROL EVALUATION

Farm Owner Dies during Tractor Overturn Case Report: 04NY077

SUMMARY

On August 9th, 2004 a 76-year-old dairy farm owner was fatally injured when the tractor he was operating overturned, pinning him underneath the tractor. The farmer had been moving large round hay bales from a field using a hay wagon pulled by a tractor when the incident occurred. As the farmer attempted to drive the tractor/wagon combination down a sloping farm lane, the weight of the loaded wagon overcame the tractor, pushing the tractor to the side of the lane. The wagon continued forward and pushed the tractor into a jack-knifed position, causing the steel tongue connecting the wagon and tractor to snap in half, thus allowing the wagon to continue down the slope. The tractor continued to skid to the side and eventually overturned, pinning the victim underneath the tractor. The victim's grandson arrived on the scene shortly after the incident occurred and went for help, asking the victim's wife to call 911. After the local emergency squad and personnel from the County Sheriff's office arrived, the medical examiner was contacted and pronounced the victim dead at the scene.

New York State Fatality Assessment and Control Evaluation (NY FACE) investigators concluded that to help prevent similar incidents from occurring in the future:

- ***The weight of tractor/trailer combinations should be properly matched to ensure safe towing operation;***
- ***All agricultural tractors should be equipped with rollover protective structures (ROPS) and a seatbelt;***
- ***Tractor brakes should be routinely inspected and maintained for uniform operation.***

INTRODUCTION

On August 9th, 2004, at approximately 3:15 p.m., a 76-year-old Caucasian male dairy farm owner was fatally injured while using a tractor and attached wagon to transport round hay bales. The farmer was traveling down an incline on a farm lane when the tractor overturned, crushing him underneath.

The NY State FACE program learned of the incident on August 10th, 2004 through media reports. A NY FACE investigator conducted a site investigation on August 25th, 2004. The investigator

worked with the Sheriff's office investigator who was on the scene the day of the incident. Additionally, the FACE investigator spoke with the victim's wife regarding the incident and reviewed the medical examiner's report.

The dairy farm where the incident occurred had been in the family for many generations and was owned and operated by the victim and his wife. The victim's son worked on the farm, and the victim's grandchildren, who also lived on the farm, occasionally helped with some of the farm chores. The farmhouse, barn, and farmyard area were located in a valley, with field locations both in the valley and on top of the hill located behind the farmstead. The victim worked full-time on the farm and had operated equipment on this particular farm lane regularly during his lifetime.

INVESTIGATION

On August 9th, 2004 the farm owner was moving large round hay bales from an upper field location down to the barn area for storage. The farmer and his 15-year-old grandson loaded round bales onto two wagons in a distant field on top of the hill. They loaded eight round bales onto each of the two wagons, and then began transporting the hay bales down to the barn for storage. The farmer was driving a 1969 John Deere model 2020 tractor with the attached hay wagon. The 15-year-old grandson was driving a second tractor pulling the other hay wagon behind his grandfather. They were traveling on a dirt farm lane that descended at a 27-degree slope down to the farm. The farm owner had driven up and down this lane regularly his entire lifetime on this farm.

On the day of the incident, as the farmer descended the sloping farm lane, the weight of the wagon with the hay bales began pushing the tractor down the hill. The hay bales weighed approximately 800 pounds each. The combined weight of the eight hay bales and wagon was approximately 8,000 pounds. The tractor weighed approximately 4,500 pounds. As the tractor and trailer descended the slope, the weight of the hay wagon began pushing the tractor uncontrollably. The evidence at the scene indicated that the farmer applied the tractor brakes, resulting in the left rear wheel locking up and the tractor skidding to the left side of the lane, which was the uphill side. The weight of the hay wagon pushed the tractor off the lane. As the tractor veered sharply to the left, the forward momentum of the wagon further pushed the tractor around, causing it to jack-knife. As this occurred, the steel tongue of the tractor snapped in half allowing the wagon to continue forward, past the tractor. The tractor was pushed around to the left, overturned and ultimately faced back up the hill 180 degrees from its original travel direction. The farmer remained in the operator position with his foot on the brake pedal and was crushed underneath the weight of the tractor.

The grandson, who was driving the second tractor down the slope, was around the bend in the farm lane and did not see the incident occur. As he rounded the bend, he saw the back of the hay wagon off to the side of the lane and thought that his grandfather had pulled over and was waiting. As he approached, he saw that the tractor was overturned on the side of the lane, and that the wagon had proceeded past the tractor. The grandson was unable to stop his tractor immediately due to the weight of the hay wagon behind his tractor, but once he was able to come to a complete stop he got off of his tractor and ran back to help his grandfather. He could see that his grandfather was underneath the tractor, and called out to him.

When the grandson received no reply, he went back to his tractor, drove back down to the farmstead and told his grandmother to call 911. The local emergency squad responded to the scene along with the County Sheriff's office. The responding County Sheriff subsequently called the medical examiner who pronounced the victim dead at the scene.

During the post-accident investigation it was determined that the evidence at the scene indicated that only the left rear tire skidded across the lane when the brakes were applied on the farm tractor. There was no indication on the dirt road that the right tire skidded across the lane. This dirt road was dry on the day of the incident and would have clearly left marks from skidding.

Since the tractor had dual brake pedals, it is possible that the operator only hit the left brake pedal; however, it appeared that the brake pedals were locked together, which would normally apply equal braking pressure to both wheels. In addition to the discrepancy between the weight of the wagon and the tractor, this lack of uniform braking also contributed to the tractor veering to the left side of the lane.

It is also important to note that during this summer there was an unusually high amount of rain, and the hay bales that were being transported on the day of the incident were greener and had soaked up additional weight from the rain. This was a factor in the overall weight of the hay wagon attached to the tractor.

CAUSE OF DEATH

The medical examiner listed the cause of death as cervical spine fracture.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: *Tractor/trailer combinations should be properly matched to ensure safe towing operation.*

Discussion: In this event, the mass of the towed hay wagon was much greater than the mass of the tractor. Due to the heavy weight of the round hay bales, this mass may have been larger than normal loads carried on this wagon. In this situation, using either a larger tractor or reducing the load on the wagon, would have lessened the chance that the tractor would be pushed out of control.

Recommendation #2: *Install rollover protective structures (ROPS) and seatbelts on all agricultural tractors. [Note: Owners of older model tractors should contact their county extension agent, equipment dealer, or equipment manufacturer to determine if retrofit ROPS and operator restraint systems are available for their equipment. Such systems should be installed by the manufacturer or an authorized dealer.]*

Discussion: Preventing death and serious injury to tractor operators during rollovers requires the use of rollover protective structures (ROPS) and a seat belt. ROPS can either be a two-post, a four-post, or a design that is incorporated into an approved ROPS cab. The rollover protective structure is designed to protect the operator in the event of an overturn. A seatbelt is part of this ROPS system and ensures that the operator remains in the zone of protection in the event of an overturn.

The tractor in this incident, manufactured in 1969, was not equipped with a ROPS. These safety features were not required on tractors until 1976, when OSHA Standard 29 CFR 1928.51 went into effect. Given the steep slopes and environmental conditions that deteriorate field roads in New York, all farmers should retrofit their older tractors with a properly designed, manufactured, and installed ROPS and seat belt. If the tractor involved in this incident had been fitted with a ROPS and seat belt, and the seat belt had been in use, this fatality might have been prevented. Retrofit ROPS kits are available for the type of tractor involved in this incident.

Recommendation #3: *Tractor brakes should be routinely inspected and maintained for uniform operation.*

Discussion: In this scenario, the tractor pulled to the left as it was being pushed down the slope. This could have resulted from the brakes not slowing the wheels uniformly between the left and right side.

Keywords: *tractor, machinery, overturn, ROPS, agriculture, dairy farm*

REFERENCES

1. New York FACE Program Report No. 02NY023
<http://www.health.state.ny.us/nysdoh/face/02ny023.htm>
2. NIOSH FACE Program Report No. 9320
<http://www.cdc.gov/niosh/face/In-house/full9320.html>

The Fatality Assessment and Control (FACE) program is one of many workplace health and safety programs administered by the New York State Department of Health (NYS DOH). It is a research program designed to identify and study fatal occupational injuries. Under a cooperative agreement with the National Institute for Occupational Safety and Health (NIOSH), the NYS DOH FACE program collects information on occupational fatalities in New York State (excluding New York City) and targets specific types of fatalities for evaluation. NYS FACE investigators evaluate information from multiple sources. Findings are summarized in narrative reports that include recommendations for preventing similar events in the future. These recommendations are distributed to employers, workers, and other organizations interested in promoting workplace safety. The FACE program does not determine fault or legal liability associated with a fatal incident. Names of employers, victims and/or witnesses are not included in written investigative reports or other databases to protect the confidentiality of those who voluntarily participate in the program.

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

New York State Department of Health FACE Program
Bureau of Occupational Health
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Troy, NY 12180

1-866-807-2130

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