

## **FINAL KY FACE 94KY040-001**

Date: 8 August 1994

### **Subject: Tractor Overturn Kills Farmer**

#### **SUMMARY**

A 60-year-old farmer died when the tractor he was operating rolled over on top of him. The victim was attempting to hook up a camper to a tractor in order to pull it to a paved roadway. Having recently sold the camper, the farmer, assisted by the buyer, was preparing to remove it from the farmer's property.

The victim, driving a tractor which was equipped with a front end loader, pulled forward past the tongue of the camper in order to line up the tractor draw bar with the camper tongue. The ground sloped more than one-half inch per foot downward toward the front of the camper. As he pulled forward and down hill, the right front wheel slid over an embankment causing the tractor to roll over. Evidence at the scene, such as indentations in the ground and pushed-over brush and cedar trees, suggest that the tractor slid, then rolled just once before coming to rest on the victim. The right rear fender crushed the victim's skull. The investigator concluded that to prevent similar occurrences, tractor owners and operators should:

- Contact county extension agent or local equipment dealer to determine if retro-fit rollover protection and seat belts are available for their equipment.
- Evaluate the slope of the land and ground conditions before beginning a procedure.
- Remove extra weight from the front end to assure balance in the equipment's center of gravity and improve visibility.
- Keep equipment in good working order.

#### **INTRODUCTION**

On May 16, 1994, a 60-year-old farmer died after the tractor he was operating rolled over on him. On May 18, 1994, the local newspaper reported the incident. On May 23, 1994, the Kentucky FACE investigator and the county coroner traveled to the site to conduct an investigation. The tractor, its attachment and the incident site were photographed. Photographs of the scene immediately after the incident were taken by state police and reviewed by the FACE investigator. The incident was discussed with the investigating officer and the victim's daughter-in-law.

The victim had retired from truck driving about a year and a half prior to the incident. He had

operated farm equipment part-time for many years. He was not the owner of the tractor.

## **INVESTIGATION**

The victim had recently sold a camper which was parked on his land. He was attempting to hook up the camper and pull it through a single lane dirt road to a paved road approximately 1/4 mile away. From there, the buyer would hook up the camper to his truck.

The victim approached the camper's left side driving a 1971 Massey-Ferguson 1100 with a 1968 John Deere 46A front end loader attachment. The tractor had no roll over protection system (ROPS) or operator restraint system. These features were not available at the time of manufacture, however retro-fit ROPS could be made for this unit. The front wheels were spread wide to nearly the same distance apart as the rear tires.

At approximately 5:15 p.m. on the day of the incident, operating next to and parallel with the camper, the victim drove the tractor forward past the camper and turned slightly to the right. In order to line up the draw bar with the trailer's tongue, the victim drove down hill beyond the camper about 30 feet and would attempt to back up. The land sloped three degrees toward the front of the tractor. The surface was hard-packed dirt dry in most places. The afternoon of the incident was clear. As the victim went forward, the right front wheel slid over a 40 degree embankment. The dropping off of the right front wheel caused the tractor to go forward over the embankment, turn over to the right, and come to rest on top of the victim.

The buyer of the camper, who witnessed the tractor turnover as he stood near the tongue of the camper, approached the victim, saw he needed help and went to a mobile home approximately 100 feet away. The EMS were notified at 5:15 pm. and arrived on the scene at 5:32 pm. The coroner was notified of the fatality at 5:30 pm. The coroner pronounced the victim dead at the scene at 6:15 pm.

The tractor was righted and taken away from the scene to a location approximately 1000 feet away. The tractor sustained damage during the rollover. The exhaust was broken off, the right fender was off, the steering wheel bent, the hood was crushed, the seat bent. The front end loader attachment did not appear damaged. The tires were all inflated. The hydraulic controls for the loader were noted to be leaking hydraulic fluid. The tractor appeared in poor overall condition. Excess oil or fluid was present on the engine block. The hour meter read 2439.0.

Contributing factors include:

- 1) The slope of the land: the 3 degree slope (over 1/2 inch per foot) would be enough to allow the tractor to roll forward when it was out of gear or when the clutch was depressed. The unintentional roll forward while shifting the tractor from forward to reverse could have allowed the wheel to go over the edge and contribute to the subsequent roll over.
- 2) The front end loader: the additional 1600 pound front end loader could have added to the momentum as the tractor began sliding off the edge of the road. The front end loader may have also blocked the victim's view of the embankment, therefore contributing to the incident.

3) The poor repair of the equipment: the equipment had been leaking fluid from the hydraulic system which controls the front end loader. If the front end loader dropped or shifted while in position, it could have contributed to this fatality. A drift test was not performed by the investigator.

## **CAUSE OF DEATH**

The coroner's report lists the cause of death as a crushed head due to accident.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1:** Tractor owners and operators should contact their county extension agent, local equipment dealer, or equipment manufacturer to see if retro-fit rollover protection and operator restraint systems are available for this equipment. The tractor should have roll over protection and restraints.

**Discussion #1:** The tractor in this incident, manufactured in 1971, was not equipped with a ROPS or an operator restraint system, which protect operators in the event of a rollover. These safety features were not required on tractors until 1976, when OSHA standard 1928.51 subpart C titled "Roll-over Protective Structures (ROPS) for tractors used in Agricultural Operations" went into effect. This standard requires agricultural tractors manufactured after October 25, 1976 to have rollover protection and seat belts. Retro-fit ROPS and operator restraint systems are available for older model tractors. This tractor could have been fitted with ROPS. Tractor owners should contact dealers, manufacturers or county extension agents for information about ROPS sources. Owners should install ROPS on their tractors (NIOSH update).

**Recommendation #2:** Tractor owners should evaluate the terrain before beginning any operation that includes machinery.

**Discussion #2:** The area where the camper was parked and the area in front of the camper was gradually sloping downward. Although the area had been recently covered with dense grade gravel (since the incident), the overall surface was smooth. The slope downward was enough to allow the tractor to roll if it were out of gear, the clutch was depressed, and the brake not applied.

**Recommendation #3:** The additional attachments should be removed when not being used or extreme caution should be exercised when the attachment shifts the center of gravity or obscures operator view.

**Discussion #3:** The front end loader added approximately 1600 lbs. to the weight of the tractor. Because it extended 2' beyond the body of the tractor, it altered the tractor's weight distribution. Its configuration extending beyond the tractor front added weight to the front wheels. When the wheel slid on the packed dirt and gravel, underlying media gave way. It is possible that the front end loader obscured the operator's view of the land causing him unknowingly to drive too close to the embankment. This could contribute to the rollover (National Safety Council).

**Recommendation #4:** The tractor should be maintained in good operating condition.

**Discussion #4:** The condition of the 1971 tractor was less than optimum. Several hydraulic systems were leaking. The overall condition of the tractor was poor. The witness and the victim's wife reported the victim knew of the faulty brakes and hydraulic system.

## **References**

Standard Number 1928.51 Subpart C US Department of Labor Occupational Safety and Health Administration, OSHA CD-ROM (OSHA A94-2) February 1994.

Effectiveness of Roll Over Protective Structures for Preventing Injuries Associated with Agricultural Tractors. MMWR 42(03); 57-59.

National Safety Council (1978). "Tractor Operation and Roll-Over Protective Structures." Occupational Safety & Health Data Sheets. I-622-Reaf. 85.

National Institute for Occupational Safety and Health (Jan 29, 1993). "NIOSH Reports on the Preventability of Tractor Rollovers." Centers for Disease Control and Prevention. DHHS (NIOSH) publication No. 93-119.