The National Institute for Occupational Safety and Health (NIOSH)

Promoting productive workplaces through safety and health research

Farmer Dies Following a Tractor Rollover in West Virginia

Case: 03WV001-01
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SUMMARY

On January 18, 2003, a 73-year-old male farmer (victim) died of injuries sustained when the tractor he was driving over turned after sliding sideways down a soft shale bank adjacent to his snow covered work area. The victim had just loaded a large round bale on a flat bed trailer and was returning to the bale storage area when his left front and rear wheels came too close to the bank's edge. The soft snow covered bank gave way causing the tractor to slide sideways down the bank then overturning. The tractor landed upside down pinning the victim. The tractor did not have a rollover protective structure (ROPS) or a seat belt. The victim's wife came out to check on her husband and found him pinned under the tractor. She called EMS which arrived within minutes and found no signs of life. The body was extricated and transported to the local funeral home. The cause of death was listed as traumatic asphyxia as well as chest and head trauma. The WV FACE investigator concluded that to reduce the likelihood of similar occurrences, the following guidelines should be observed by tractor owners:

- **Equip all tractors with ROPS and a seat belt.**
- **Demarcate and/or barricade bank edges near barns, storage areas, and work zones.**

INTRODUCTION

On January 23, 2003, the WV FACE Program was notified by a County Extension Agent that a tractor-related death had occurred on January 18, 2003. The field investigator traveled to the site on April 30, 2003 and met with the local USDA field service representative to discuss the incident. Photographs and measurements were taken of the incident site. The victim's widow was also interviewed. The death certificate, medical examiner's report, county sheriff's report and photographs were also obtained and reviewed.

The victim was a full-time farmer. He farmed 250 acres and maintained a heard of 62 beef cattle. In addition, he grew, baled, and sold straw. He had owned, operated, and maintained the tractor involved in the incident for the past 20 years. He had never had any other tractor-related incidents. The tractor, purchased new in 1982, did not have a ROPS or a seat belt. However, at the time of purchase, a ROPS and seatbelt were an available dealer option.

INVESTIGATION

On January 18, 2003, a 73-year-old male farmer (victim) died of injuries sustained when the tractor he was driving over turned after sliding sideways down a soft shale bank adjacent to his snow covered work area. The victim was using a 1982 Case Model 1394 tractor, which was equipped with a front end loader (see Figure 1). Just prior to the incident, the victim was loading large round bales of straw onto a flat bed trailer. Due to a recent snow, and his concerns about being able to pull a loaded trailer up-hill from the usual loading area, he had established a temporary loading area. The temporary work area was actually a farm-related dirt road that had been widened with shale within the past year or so and therefore its edge was fairly soft (see Figure 2). Although the victim had performed loading operations often, it was reported that the loading had never been done in this particular area. The victim had just loaded a large round bale on a flat bed trailer and was returning to the bale storage area when his left front and left rear wheels came too close to bank's edge (see Figure 3). The soft snow covered bank gave way causing the tractor to slide then roll sideways down the hill (see Figure 4). The tractor landed upside down pinning the victim (see Figure 5). The tractor did not have a ROPS or seat belt. The victim's wife came out to the work zone to check on the victim and found him pinned under the tractor. She called EMS which arrived within minutes and found no signs of life. The body was extricated and transported to the local funeral home.

CAUSE OF DEATH

The cause of death was listed as traumatic asphyxia as well as chest and head trauma.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Equip all tractors with ROPS and a seat belt.

[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 ROPS and a seat belt. These structures, either a roll-bar frame or an enclosed roll-protective cab, are designed to withstand the dynamic forces during a rollover. In addition, seat belt use is necessary to ensure that the operator remains within the ?zone of protection" provided by the ROPS. OSHA regulations require that all tractors built after October 25, 1976, and used by employees of a farm which employs 11 or more must be equipped with ROPS and a seat belt.1 In West Virginia, many tractors are in use on family farms with fewer than 11 employees and therefore do not fall under OSHA regulations. Given the uneven terrain and environmental conditions in West Virginia, all farmers should voluntarily have their older tractors retrofit with a properly designed ROPS and seat belt system. A ROPS was and still is available for the tractor involved in this incident (1982 Case 1394). If the tractor had been equipped with a ROPS and seat belt had been used, this fatality might have been prevented.

Recommendation #2: Demarcate and/or barricade bank edges near barns, storage areas, and work zones.

Discussion: Hilly terrain which has been graded usually will result in a steep bank or drop-off. In addition, recently graded terrain, especially near the edge of a bank, will yield a surface which provides little support for equipment. Sudden shifts in a tractor's center of gravity (CG), due to soft terrain near edges, has often resulted in overturn. In this incident, the tractor's front left and rear wheels came too close to a soft edge causing a slide and CG shift which resulted in an overturn. Farmers should realize that operating equipment within close proximity to a bank's edge is dangerous. Changes in the environment, equipment, and the operator's judgment or any combination there of is always possible. Therefore, bank edges near barns, storage areas and other work zones need additional consideration. Simply demarcating the edge with section of fence will provide the equipment operator with a visual warning and an established work zone boundary. Greater operator protection can be achieved by barricading the edge with a series of large boulders or large diameter logs that are sufficient to prevent equipment from getting too close to the edge. Had this edge been demarcated and/or barricaded in some manner, this incident may have been prevented.

REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1928.51 (b), U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., April 25, 1975.

ILLUSTRATIONS

Figure l. 1982 Case Model 1394. Photo was taken shortly after the incident.

Figure 2. Photo shows the nature of the aggregate which was used to widen the road.

Figure 3. The far side of the white line depicts part of the area that had been widened. The orange flags indicate where the left front and left rear wheels began to slide. The arrow indicates the intended direction of travel.

Figure 4. The black arrows indicate the slide marks which were made by the front left and rear wheels. The point of the arrows indicate the approximate position of the wheels when the tractor began to roll. This photo was taken over the bottom of the overturned tractor. In the foreground is the end loader bucket. From this perspective, the front of the tractor is on your left.


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Figure 5. The tractor's final resting place. Photo was taken from the bank's edge.

FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The WVU Center for Rural Emergency Medicine, through a contract with the West Virginia Department of Health and Human Resources and Bureau for Public Health, conducts investigations on the causes of work-related fatalities within the state. The goal of this program is to prevent future fatal workplace injuries. West Virginia FACE intends to achieve this goal by identifying and studying the risk factors that contribute to workplace fatalities, by recommending intervention strategies, and by disseminating prevention information to employers, employees, trade associations, unions, equipment manufacturers, students, teachers, and others with an interest in workplace safety.

Please use information listed on the Contact Sheet on the NIOSH FACE website to contact In-house FACE program personnel regarding In-house FACE reports and to gain assistance when State-FACE program personnel cannot be reached.

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