

NJ FACE INVESTIGATION REPORT



Fatality Assessment & Control Evaluation Project

FACE 03-NJ-093

September 23, 2004

Motocross Track Owner Killed When Tractor Overturned

On October 18, 2003, a 50-year-old co-owner of a motocross track died when he was crushed under an overturned 1949 farm tractor he was operating to groom a sandy motocross track. His tractor was climbing a sandy berm and pulling a steel “I” beam to smooth out the ruts left by riders on the track. The “I” beam, connected to the tractor by a chain, became imbedded in the loose, sandy soil and may have exerted resistance to the forward motion of the vehicle. Since the bulk of the weight of the tractor was in the rear, the tractor flipped back and over, and landed on the victim, crushing him. There were no witnesses to the incident.

NJ FACE investigators recommend following the following safety guidelines to prevent similar incidents:

- **Alternative vehicles should be utilized for maintaining a motocross track.**
- **Tractors should be retrofitted with Roll-Over Protective Structures (ROPS).**
- **Education and training on safe use of equipment should be provided to all equipment operators.**
- **Employers should conduct a job hazard analysis of all work activities.**



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INTRODUCTION

On October 23, 2003, a federal Occupational Safety and Health Association (OSHA) assistant area director notified the New Jersey FACE staff about this machine-related fatality that occurred on October 18, 2003; OSHA did not investigate the incident. On November 6, 2004, a NJ FACE investigator contacted the decedent's business partner, who agreed to participate in a FACE site visit and investigation. The site visit was conducted on November 18, 2003. The incident was discussed with the business partner, who had not been present on the day of the fatal injury. The site was observed and the area photographed. Although the tractor involved was not available, a smaller but similar model was present, as was a bulldozer. Additional information was obtained from the police report and medical examiner's report.

The victim was the owner of a family retail business and also co-owner of the motocross track that had started operations seven months prior to the incident. A few years prior to their partnership, his business partner had constructed a smaller motocross track on the decedent's residential property. The tractor involved in this incident was owned by the decedent's father and had been used for the decedent's home track as well as at the commercial motocross track.



The site of the fatal injury was a one-mile motocross track located on 22 acres of an abandoned sand pit in a rural area. The track was open for sport use of riders aged four years and older and for racing for ages

Photo 1
View of motocross track, NJ FACE Project

seven years and older. It was used for motorcycle and quad (four-wheel vehicle) racing. The track was composed of winding trails with, as described by the track's website, bermed turns, table-top jumps, and obstacles. The track, composed of loose dirt and sand, was groomed three to four times each week to remove ruts caused by the bikes and prepare it for the next use.

The usual procedure was to pull a 10-foot-long steel "T" beam behind a 1949 tractor to groom the



course and parking area. The "T" beam was attached to the tractor's 3-point rear hitch. The weight of the beam dragged the sand and loose dirt to cover the ruts.

Other than the two owners, the track employed no full-time workers and had no formal

Photo 2
Tractor involved in incident, NJ State Police photo

employee training or safety program. They employed two Emergency Medical Technicians (EMT), one of whom was present whenever a rider used the track. On the day of the incident, the victim's wife acted as a ticket-taker and one teenaged part-time employee had been present. An EMT had been on duty with the track's fully-equipped ambulance.

INVESTIGATION

The fatal injury occurred on a Saturday at approximately 4:30 p.m. The decedent apparently came to the track in the morning, left for a period of time, and returned in the afternoon. The last rider left at 3:30 p.m., followed soon after by the EMT. The decedent and his wife decided to close the track at 4:30 p.m., instead of the usual 5:00 p.m. weekend closing time. Their teenaged

part-time helper departed at 4:30 p.m. with his father. While his wife waited in the entrance booth area, the owner proceeded to groom the track.

There was no witness to the incident, but apparently as the decedent groomed the track, he drove the tractor up a ten-foot incline, pulling the “I” beam behind the tractor. The slope was approximated by his business partner as 22 degrees. Due to the slope of the incline, and the amount of loose sand/dirt at the lower part of the incline, the “I” beam became buried in the loose dirt (as it was when the police officers arrived), and exerted drag on the tractor. The decedent’s partner speculated that the tractor may have gotten stuck approximately $\frac{3}{4}$ of the way



Photo 3
Tractor on track incline, NJ FACE Project

to the top of the incline, with the rear wheels spinning and sinking into the sand.

According to the partner, the operator may have stayed on the throttle or “popped” the clutch in an attempt to advance the tractor. Since most of the weight of the tractor was in the rear of the vehicle, the front of the tractor rose from the ground, flipped back and over, and

landed on top of the victim, trapping him between the tractor and the ground. The steering wheel landed on the decedent’s chest.

When the decedent’s wife realized that she could no longer hear the sound of the tractor’s engine, she walked to an area near the track to check on her husband. She observed the overturned tractor and immediately called the teenaged employee’s father, and then called 911 to summon the state police who served this rural area. The worker’s father returned to the track, checked the victim for a pulse, and found none. He planned to try to upright the tractor by pulling it with his vehicle, but before he could do so, the state police arrived on the scene. The

police were followed by the local rescue squad, fire department, and a paramedic unit from the nearest medical center. All attempts to resuscitate the decedent were unsuccessful and he was pronounced dead at the scene at 5:16 p.m. via telemetry.

RECOMMENDATIONS/DISCUSSIONS

Recommendation #1: Alternative vehicles should be utilized for maintaining the motocross track.

Discussion: Several factors contributed to the tractor's rear rollover: use of a farm tractor, with most of its weight in the rear; driving forward up an incline; soft terrain; and pulling a heavy "I" beam over soft ground. Various forces can cause a moving tractor to destabilize. According to the New York Center for Agricultural Medicine and Health (West, 2003), in a rear rollover, a force called "axle torque" becomes a factor. This is the force that the motor applies to the tractor's axle that causes the axle to turn and make the tractor move. Under normal conditions this force is transferred from the motor to the axle, causing it to rotate and move the tractor forward. In the rear rollover, the tractor rotates around its own rear axle instead of moving forward. The causes of this may include having excess traction that does not allow the wheels to spin, accelerating after the tractor has started up a slope, or hitching loads too high on the tractor. Rear rollovers are usually the result of trying to tow something that is heavy on terrain that does not allow wheel spin, such as sand or loose dirt. Excessive torque is applied by "gunning" the motor. If the load cannot be moved and the wheels cannot spin, the torque is dissipated by rotating the whole tractor around its axle.

The track also owned a bulldozer, a tracked vehicle with its own roll-over protective structure. Since the incident, the co-owner of the track has been using the bulldozer, pulling an "I" beam, to groom the track. A bulldozer is preferable for the sloped terrain and soft, loose soil of the track. Other recently manufactured vehicles or machines to groom the track may be available. Users should discuss potential new equipment with manufacturers and equipment dealers to ensure that safe and appropriate equipment are selected.

Recommendation #2: Tractors should be retrofitted with Roll-Over Protective Structures.

Discussion: When the tractor involved in this incident was manufactured (approximately 1949 or 1950), roll-over protective structures (ROPS) were not factory-installed. Due to the danger of roll-overs, tractors should be retrofitted with ROPS. Older tractors that cannot readily be retrofitted should not be used for pulling or dragging heavy objects, on sloping ground, or for any other high-risk task. Tractors that have ROPS should also have functioning seat belts that are utilized.

Recommendation #3: Education and training on safe use of equipment should be provided to all equipment operators.

Discussion: Currently, the owner of the track operates the equipment to groom the track. As their business grows and the track expands, this task may also be assigned to other workers. It is essential that all workers who operate equipment, including tractors and bulldozers, be trained on the safe operation of power equipment, and demonstrate safe operation of the equipment for the intended task.

Recommendation #4: Employers should conduct a job hazard analysis of all work activities.

Discussion: To prevent incidents such as this, NJ FACE recommends that employers conduct a job hazard analysis of all work areas and job tasks with the employees. A job hazard analysis should begin by reviewing the work activities that the employee is responsible for, and the equipment that is needed. Each task is further examined for mechanical, electrical, chemical, or any other hazard the worker may encounter. The results of the analysis can be used to design or modify a standard operating procedure and employee training program. Additional information on conducting a job hazard analysis is included in the Appendix.

RECOMMENDED RESOURCES

It is extremely important that employers obtain accurate information on health, safety, and applicable OSHA standards. NJ FACE recommends the following sources of information which should help both employers and employees:

U.S. Department of Labor, Occupational Safety & Health Administration (OSHA)

Federal OSHA will provide information on safety and health standards on request. OSHA has several offices in New Jersey that cover the following counties:

- ☎ Hunterdon, Middlesex, Somerset, Union, and Warren counties.....(732) 750-3270
 - ☎ Essex, Hudson, Morris, and Sussex counties.....(973) 263-1003
 - ☎ Bergen and Passaic counties.....(201) 288-1700
 - ☎ Atlantic, Burlington, Cape May, Camden, Cumberland, Gloucester,
Mercer, Monmouth, Ocean, and Salem counties.....(856) 757-5181
- 🌐 Federal OSHA Website: www.osha.gov

NJ Public Employees Occupational Safety and Health (PEOSH) Program

The PEOSH Act covers all NJ state, county, and municipal employees. Two state departments administer the act; the NJ Department of Labor and Workforce Development (NJDLWD), which investigates safety hazards, and the NJ Department of Health and Senior Services (NJDHSS), which investigates health hazards. PEOSH has information that may also benefit private employers.

NJDLWD, Office of Public Employees Safety

- ☎ Telephone: (609) 633-3896
- 🌐 Website: www.nj.gov/labor/lse/lspeosh.html

NJDHSS, Public Employees Occupational Safety & Health Program

- ☎ Telephone: (609) 984-1863
- 🌐 Website: www.state.nj.us/health/eoh/peoshweb

NJDLWD Occupational Safety and Health On-Site Consultation Program

Located in the NJ Department of Labor and Workforce Development, this program provides free advice to private businesses on improving safety and health in the workplace, and complying with OSHA standards.

☎ Telephone: (609) 984-0785

🌐 Website: www.nj.gov/labor/lsse/lsonsite.html

New Jersey State Safety Council

The NJ State Safety Council provides a variety of courses on work-related safety. There is a fee charged for the seminars.

☎ Telephone: (908) 272-7712.

🌐 Website: www.njsafety.org

Internet Resources

Other useful Internet sites for occupational safety and health information:

www.cdc.gov/niosh - The CDC/NIOSH website.

www.dol.gov/elaws -USDOL Employment Laws Assistance for Workers and Small Businesses.

www.nsc.org - National Safety Council.

www.state.nj.us/health/eoh/survweb/face.htm - NJDHSS FACE reports.

www.cdc.gov/niosh/face/faceweb.html - CDC/NIOSH FACE website.

www.nycamh.com – New York Center for Agricultural Medicine and Health

REFERENCES

Agricultural Health and Safety Newsletter, Rutgers Cooperative Extension, P.O. Box 231, New Brunswick, NJ, Winter, 1997.

Job Hazard Analysis. US Department of Labor Publication # OSHA-3071, 1998 (revised). USDOL, OSHA/OICA Publications, PO Box 37535, Washington DC 20013-7535.

Occupational Fatality Report 03-WV-01, West Virginia FACE Project.
Occupational Fatality Report 02-WV-024, West Virginia FACE Project

West D, Safety for Agricultural Education, Volume 6, No. 1, Fall 2003, New York Center for Agricultural Medicine and Health, Northeast Center, 1 Atwell Road, Cooperstown, NY 13326.

West D, Country Folks Newspaper, June 3, 2002

DISTRIBUTION LIST

NIOSH

Employer

Incident Site Owner

Decedent's Family

Labor Union(s)

NJ State Medical Examiner

County Medical Examiner

Local Health Officer

NJDHSS Occupational Health Service Internet Site

NJDHSS Census of Fatal Occupational Injuries (CFOI) Project

Fatality Assessment and Control Evaluation (FACE) Project
Investigation # 03-NJ-093

Staff members of the New Jersey Department of Health and Senior Services, Occupational Health Service, perform FACE investigations when there is a report of a targeted work-related fatal injury. The goal of FACE is to prevent fatal work injuries by studying the work environment, the worker, the task and tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. FACE gathers information from multiple sources that may include interviews of employers, workers, and other investigators; examination of the fatality site and related equipment; and review of OSHA, police, and medical examiner reports, employer safety procedures, and training plans. The FACE program does not seek to determine fault or place blame on companies or individual workers. Findings are summarized in narrative investigation reports that include recommendations for preventing similar events. All names and other identifiers are removed from FACE reports and other data to protect the confidentiality of those who participate in the program.

NIOSH-funded state-based FACE Programs include: Alaska, California, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New York, Oklahoma, Oregon, Washington, West Virginia, and Wisconsin. For further information, visit the NJ FACE website at www.state.nj.us/health/eoh/survweb/face.htm or the CDC/NIOSH FACE website at www.cdc.gov/niosh/face/faceweb.html.

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