



U. S. Department of Labor
Occupational Safety and Health Administration
Directorate of Science, Technology & Medicine
Office of Science and Technology Assessment

Hazards Associated with All-Terrain Vehicles (ATVs) in the Workplace

Safety and Health Information Bulletin

SHIB 08-03-2006

Preface

Although the majority of all-terrain vehicle (ATV)-related injuries and deaths occur during recreational use, ATV use in America's workplaces is widespread and increasing, particularly in the agricultural industry. Injury and fatality statistics for ATV recreational use may provide some information about likely trends in the workplace. In September 2005, the Consumer Product Safety Commission (CPSC) published a report indicating that ATV-related fatalities rose from 29 in 1982 to 470 in 2004, and injuries rose to an all-time high of 136,100 for 2004, with over 800,000 injuries reported in the last 10 years [4].

Although these statistics were only for recreational use of ATVs (occupational injury data for ATVs is not collected, compiled and reported in the same manner as that for recreational use), employees who use ATVs while doing their jobs are exposed to hazards similar to those experienced by recreational users. Data on occupational injuries provided to the Bureau of Labor Statistics (BLS) by employers includes over 100 occupational fatalities involving ATVs during the last ten (10) years. (see Table 1) [6] Fatalities and injuries appear to have occurred at a steady rate during the last several years. The Occupational Safety and Health Administration's (OSHA's) investigation data includes 50 workplace accidents in the last ten (10) years that resulted in a workplace injury or fatality and involved an ATV. As ATV use increases in the workplace, employers and employees can reduce the risk of injury by modifying work practices, operating ATVs within manufacturer's limitations, wearing helmets, and obtaining vehicle-specific training.

This Safety and Health Information Bulletin is **not** a standard or regulation, and it creates no new legal obligations. The Bulletin is advisory in nature, informational in content, and is intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with hazard-specific safety and health standards. In addition, pursuant to Section 5(a)(1), the General Duty Clause of the Act, employers must provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm. Employers can be cited for violating the General Duty Clause if there is a recognized hazard and they do not take reasonable steps to prevent or abate the hazard. However, failure to implement any recommendations in this Safety and Health Information Bulletin is not, in itself, a violation of the General Duty Clause. Citations can only be based on standards, regulations, and the General Duty Clause.



Figure 1: All-Terrain Vehicle (ATV).

Purpose

The purpose of this Safety and Health Information Bulletin (SHIB) is to identify:

1. the operating conditions and specific activities that most often lead to ATV-related injuries and fatalities;
2. the guidelines and training an employer can use to help protect employees; and
3. the work practices that employees can follow to reduce the potential for ATV-related accidents.

This SHIB is intended to address any motorized off-highway vehicle designed to travel on low pressure tires, having a seat designed to be straddled by the operator and handlebars for steering control, for use by a single operator and no passenger, and used to carry only those amounts of cargo that do not exceed the manufacturer's limits for the front and rear racks.

Background

ATVs are used in a wide variety of America's workplaces, including law enforcement, agriculture, construction, oil production, and facilities management. It is imperative that employers and employees take the necessary steps to ensure that ATVs are operated safely to minimize the number and severity of workplace accidents.

The Occupational Safety and Health Administration (OSHA) has investigated a number of workplace fatalities involving ATVs and is aware that ATV-related injuries and fatalities continue to occur in workplaces throughout the United States. In June of 2003, the Bismarck, North Dakota Area Office investigated an accident where an employee was fatally injured while driving an ATV uphill on rough terrain. The employer had fitted the ATV with a sprayer mounted on the rear cargo rack. The ATV was being used to apply herbicide to off-road weeds when the accident occurred. As an employee drove the ATV uphill on the rough terrain, its front wheels came off the ground and the ATV flipped over. The employee tried to prevent the ATV from flipping by

Table 1: Bureau of Labor Statistics ATV Occupational Fatalities & Injuries		
Year	Fatalities	Injuries*
2001	14 ⁽ⁿ⁾	240
2000	16	135
1999	13	227
1998	9	59
1997	9	56
1996	16	246
1995	9	186
1994	9	246
1993	7	117
1992	11	113
Total	113	1625
*Nonfatal occupational injuries and illnesses involving days away from work, including those with or without restricted work activity.		
* Excludes September 11 th terrorist attacks		

standing and shifting her weight; the employee eventually tried to jump from the ATV as it flipped over, but could not jump clear and was fatally crushed. OSHA's investigation identified decreased vehicle stability as the major cause of the accident. The addition of the sprayer to the ATV's rear cargo rack reduced vehicle stability by changing the distribution of vehicle weight over the wheel base. The sprayer exceeded the manufacturer's weight limit for the rear cargo rack by approximately 55 pounds (lbs.). OSHA's investigation also showed that the decrease in ATV stability was compounded when the ATV was driven up a hill on rough terrain.

OSHA accident investigation data dating back to 1990 include 24 occupational fatalities and 26 occupational injuries that involved operating an ATV. OSHA's data indicate that seven serious injuries and fatalities resulted from unbalanced loads and loads in excess of the ATV's specified limits; four of these involved overloading the rear cargo rack. The other causes of occupational accidents noted during OSHA investigations included: operating at excessive speeds for the terrain/operation; operating ATVs on paved roads; not wearing a protective helmet; insufficient or no training; and carrying passengers.

Description of Hazards

ATV Terrain and Operating Conditions

One reason employers may elect to use ATVs is that they enable employees to traverse rough terrain and get to remote locations quickly. However, it is very important that operators drive at a safe speed to accommodate the changing terrain (rocks, logs, ditches, and other obstacles) and to reduce the risk of overturning or rolling over the ATV. Traversing a slope also presents a rollover hazard to ATV operators. Rolling over or overturning an ATV is one of the leading incidents that result in fatalities [1, 5]. About 46 percent (23 of 50) of the occupational injuries and fatalities OSHA investigated (1990 – 2003) occurred when the ATV overturned. According to the investigation reports, operators overturned as a result of excessive speed, unstable load, rough terrain, and excessive incline.

ATVs are specifically designed for off-road use and are not intended to be driven on concrete or paved roads. Injuries and fatalities can occur as a result of collisions with other vehicles and as a result of the difficulty of controlling an ATV on pavement [5].

Load Limitations and ATV Modification

ATVs are engineered for certain operating conditions and for handling specific loads. Modifications to an ATV may alter its performance and increase the potential for an accident. Any modification to an ATV should be performed only after obtaining approval from the manufacturer. Modification includes the use of after-market products that are sold as accessories. Employers and drivers should read the operator's manual to understand the limitations of ATVs. The cargo (front and rear racks) and passenger weight limits of an ATV should not be exceeded because it affects the ATV's maneuverability and performance. As stated earlier, exceeding an ATV's weight capacity is a common cause of serious ATV accidents.

ATVs are not typically designed to carry passengers, and a common mistake made by ATV operators is to allow a passenger on their ATV. To

effectively steer and control an ATV, the driver often needs to make quick body weight shifts combined with acceleration and braking [1]. A passenger can impair the safe operation and maneuverability of the ATV and the additional passenger weight may exceed the manufacturer's weight limit for the ATV. Passengers are put at a high risk of injury when riding on an ATV. The CPSC reported that up to 20 percent of recreational ATV injuries occur to passengers [3, 5]. OSHA's data indicate that two occupational injuries occurred when passengers were carried on ATVs designed only for the operator. In one case, a passenger was thrown from the ATV during a turn. In the other, the passenger was pinned under the ATV when it overturned. In both cases, vehicle instability created by the additional rider likely caused the accident.

ATV Operator Qualifications and Training

Inexperienced drivers face a higher risk of injury according to the recreational data collected by CPSC. During the first month of operation, new recreational ATV drivers have an injury rate 13 times higher than the overall average injury rate for ATV operators. Further, the CPSC's data indicate that almost half the injured drivers had less than one year of experience and one-fourth of the injured drivers had less than one month of experience [5]. The often severe terrain and operating conditions, along with the unique handling of ATVs, necessitate proper training, practice, and experience.

Personal Protective Equipment

Personal protective equipment is strongly recommended when operating ATVs. The potential rollover hazards require the use of a DOT-approved helmet. According to a study of recreational ATV-related deaths in West Virginia, 65 percent of the deaths resulted from head and neck injuries. Of these fatalities, three-quarters of the ATV users were not wearing a helmet at the time of the incident [1]. CPSC indicates that 25 percent of those who died from head injuries sustained in recreational ATV accidents would have lived if they had been wearing a proper helmet [5]. In addition to helmets, appropriate boots, gloves, and goggles should also be worn.



Figure 1: Rider with proper helmet.

ATV Maintenance

Like any piece of workplace machinery, ATVs must have regular maintenance. Poor ATV maintenance contributes to serious accidents and fatalities [2]. Along with a regular maintenance schedule, employers and drivers need to ensure the completion of a pre-ride inspection. Tire condition, braking, steering, and suspension systems are all critical to safe operation.

Other Considerations

ATV manufacturers sometimes issue product recalls to replace, modify, or repair faulty products. Employers should be aware of how recall notifications are made and where to obtain pertinent information. The CPSC maintains copies of ATV recalls, which may be accessed on the CPSC's website at <http://www.cpsc.gov>. When a recall is issued by a manufacturer, employers should follow the instructions or guidance in the notice to ensure that their ATVs are maintained in proper operating condition.

Three-wheel ATVs have not been manufactured since 1988, but older three-wheel ATVs are still in use. While the stability of ATVs as a whole is low, the stability of three-wheel ATVs is generally worse than for four-wheel ATVs. Cornering and traversing slopes on three-wheel vehicles can be particularly dangerous.

Most states have enacted laws regarding ATV use. Many states have passed laws prohibiting ATV operation on public roads in most instances, and some have age and registration requirements for ATV operators. Furthermore, many states require operators to wear a protective helmet while operating an ATV. Employers should contact their state Department of Motor Vehicles, Public Safety, or Natural Resources to determine the specific requirements and obligations for their state.

Some manufacturers now build certain ATVs with rollover protection systems. Depending on the terrain and usage of the ATV, employers should consider an ATV with rollover protection.

Recommendations

The following guidelines will help reduce the risk of injury to employee operators of ATVs:

- Provide instruction and hands-on training on safe handling and operation of ATVs to employees. Ensure that employees are competent in operating their specific ATV under the variety of conditions in which they will be driving.
- The major ATV manufacturers and distributors provide free hands-on training to purchasers of new ATVs and can provide additional training at a reasonable fee. The ATV Safety Institute (<http://www.svia.org>) offers ATV classes that may be of assistance.
- Ensure that all likely ATV drivers have reviewed and understand the operator's manual.
- Ensure that all manufacturer's warnings are followed and that drivers review and understand them.

- Do not permit ATV drivers to carry passengers.
- Ensure that drivers wear proper helmets and boots. Where conditions require, ensure the use of goggles, gloves, and other safety clothing.
- Establish policies stating where ATV use is prohibited, such as on paved or public roads and in areas with high vehicular or heavy equipment traffic.
- Ensure that employees drive at appropriate speeds to allow for avoidance of potential hazards and the speed is appropriate for the type of terrain (e.g., mud, snow, ditches, gravel, etc.).
- Ensure that employees and all contractors using ATVs on your worksite are aware of any site-specific hazards, such as excavations, trenches, and areas where ATV use is prohibited.
- Establish a maintenance program for all ATVs that meets the manufacturer's recommendations to ensure proper ATV performance.
- Ensure that employees only haul items on the ATV in accordance with the manufacturer's specifications and never exceed the weight limit. Ensure loads are evenly distributed.
- Do not allow modification of ATVs without approval from the manufacturer.
- Monitor manufacturer's recalls and ensure prompt action when a recall is issued for your ATV(s).
- Training should include reviewing and becoming familiar with the operator's manual, and hands-on operation.
- Ensure that a pre-ride inspection of the ATV is performed.
 - o Check the tire condition and pressure.
 - o Ensure that the throttle, brakes, and other controls are working properly.
 - o Ensure that headlight(s) and taillight(s) are working properly.
 - o Test the steering before starting, initially at low speeds.
 - o Test the suspension system
- Ensure that ATV drivers report any damage or mechanical failures so that repairs can be made.

References

1. Centers for Disease Control and Prevention (CDC). *All-Terrain Vehicle-Related Deaths — West Virginia, 1985–1997*. Morbidity and Mortality Weekly Report (MMWR). Volume 48, No. 1. January 15, 1999. <http://www.cdc.gov/mmwr/PDF/wk/mm4801.pdf>
2. New Zealand Occupational Safety and Health Service. *Safe Use of ATVs on New Zealand Farms — Agricultural Guideline*. November 2002. <http://www.osh.govt.nz/order/catalogue/pdf/atvguide2.pdf>
3. U.S. Consumer Product Safety Commission (CPSC). *All-Terrain Vehicle 2001 Injury and Exposure Studies*. January 2003. <http://www.cpsc.gov/LIBRARY/FOIA/FOIA03/os/atvex2001.pdf>
4. U.S. Consumer Product Safety Commission (CPSC). *Annual Report: All-Terrain Vehicle (ATV)-Related Deaths and Injuries*. Washington, D.C. September 28, 2005.
5. U.S. Consumer Product Safety Commission (CPSC). *CPSC Urges Caution for Three- and Four-Wheeled All-Terrain Vehicles*. CPSC Document #540. March 2004. <http://www.cpsc.gov/cpsc/pub/pubs/540.html>
6. U.S. Department of Labor (DOL), Bureau of Labor Statistics. *BLS Statistics on Worker Safety and Health*. <http://www.bls.gov/bls/safety.htm>

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