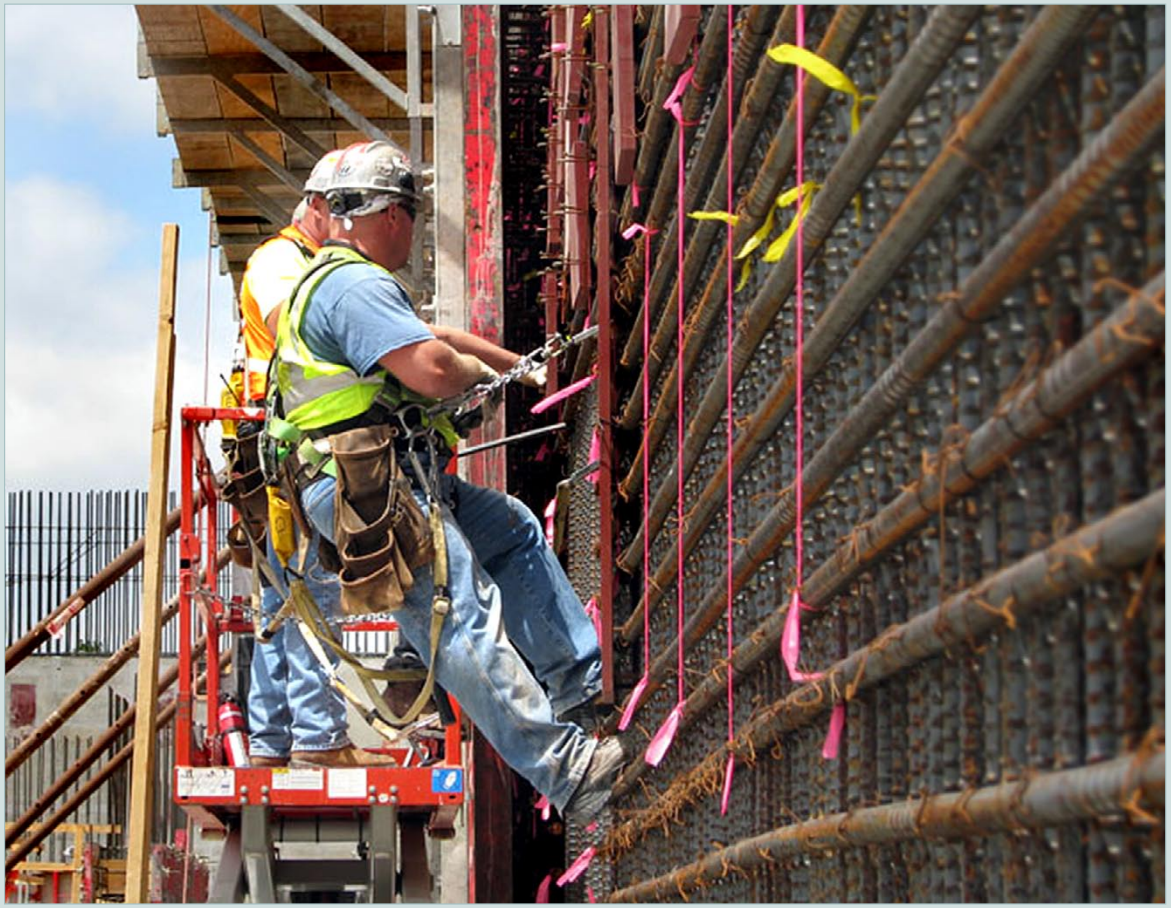
Operating Experience Summary

U.S. Department of Energy
Office of Health, Safety and Security
OE Summary 2009-01
January 30, 2009

Inside This Issue



Winter Safety Reminder—Watch Your Step

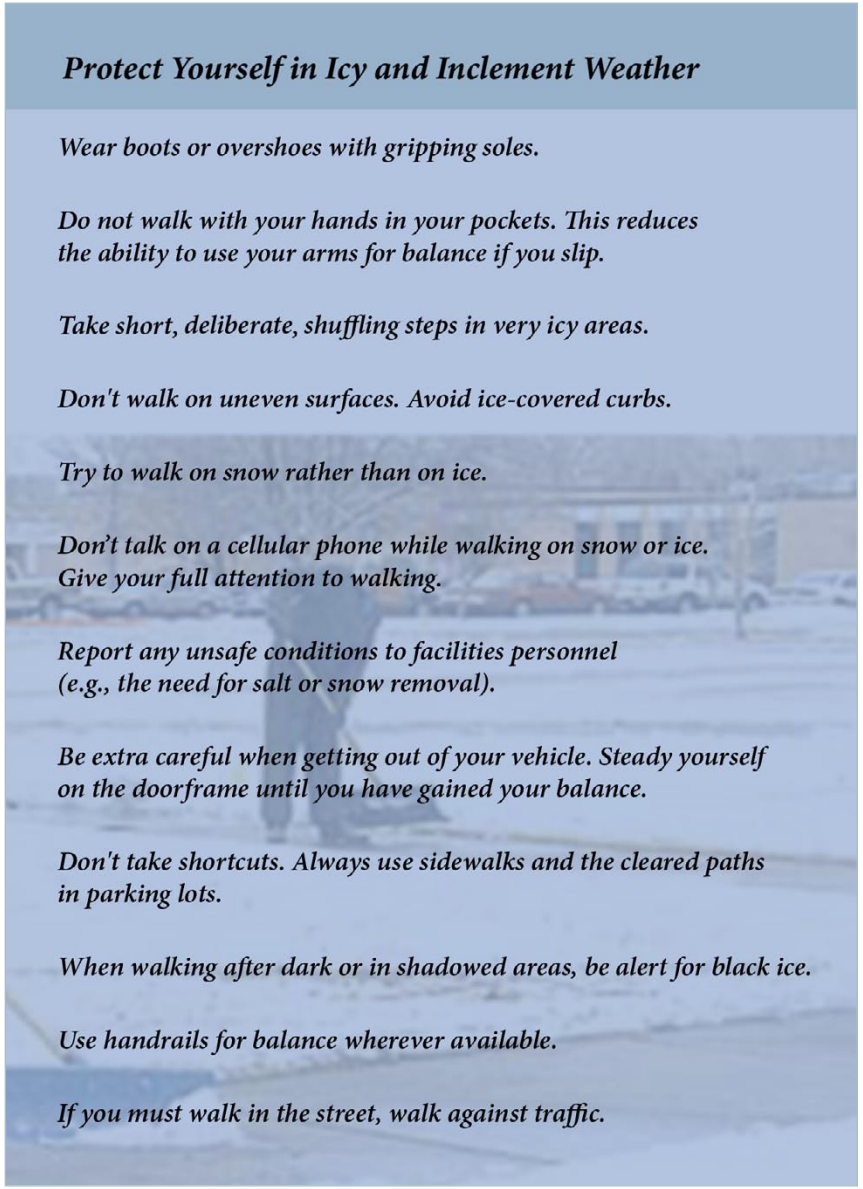
1

As the winter has progressed, numerous slip and fall events have been reported across the Complex. One recent injury at the Office of River Protection (ORP) resulted in a thorough review that identified several effective corrective actions to prevent recurrence. The slip/fall injury at the ORP Waste Treatment Plant (WTP), as well as precautionary measures for avoiding similar injuries during hazardous weather, are discussed below.

On January 5, 2009, at WTP, 4 to 6 inches of snow fell overnight following a 4-day holiday shutdown. The snowfall covered ice in parking lots and on walkways that had formed over several days of fluctuating temperatures, resulting in treacherous walking conditions. One worker slipped on the ice, fell, and broke his hip when he was walking from the parking lot to his work location. Approximately 100 other workers also fell between the parking lot and their work locations, and 30 of them reported to first aid.

ORP management identified a number of corrective actions to reduce the potential for slip and fall events during similar snow and ice conditions, including the following.

- A site-wide assessment of winter snow/ice hazards may not be sufficient to address acute facility-specific conditions/ hazards. Facility-specific hazard assessments involving professional safety staff may be required when making decisions on snow/ice removal timing and work delays.
- Workers should stay on designated cleared/treated pathways in and around the worksite.



- Improve methods of identifying designated pathways (e.g., cones, stanchions, blue flashing lights or other distinctive lighting of pathways, information boards).
- Provide workers with containers of salt or ice melt chemicals for their personal vehicles that can be spread on the parking lot as they step out of their cars and on designated pathways as they walk to work areas.
- Provide foot traction devices for shoes or boots.

Most slips and falls can be prevented by taking a few simple precautions, like those listed above. The textbox on the previous page, which is taken from OE Summary 2004-24, also lists precautions workers can take to avoid slips and falls during hazardous weather conditions. In addition, an Office of Health, Safety and Security Causal Analysis Review, *Winter Hazards, Site Safety Measures and Worker Injuries*, published December 10, 2008, includes lessons learned from slip and fall accidents that occurred in the winter of 2006–2007 and links to other winter safety information.

The Causal Analysis Review can be accessed at www.hss.energy.gov/CSA/CausalAnalysisReview_WinterHazards_121008.pdf.

Adherence to Fall Protection Requirements is Essential to Safety

2

A Lessons Learned in the DOE Corporate Lessons Learned Database recently reported that a worker inspecting a vintage railroad tank car at the Oak Ridge Y-12 site climbed onto the top of the tank car (approximately 12 feet above ground) without wearing fall protection and without being secured to any structural member of the railroad car. (Lessons Learned Identifier Y-2008-OR-BWY12-1203)

The tank car had two steel landing platforms on either side that were intended for use during inspections or when working on the tank dome, but there were no built-in handrails on the platforms. (Figure 2-1 shows a similar tank car at the site.) Accessing the platforms required an extension ladder and use of a spotter to stabilize the ladder and relocate it as needed. The worker safely climbed to the platform and stepped from the ladder while maintaining three points of contact. However, during the inspection he climbed onto the top of the tank and descended onto the platform on the opposite side without a fall protection harness, instead of descending and using the ladder to reach the platform on the opposite side of the car.

Investigators learned that when the worker arrived at the site to inspect the tank car he did not contact the construction area superintendent, so he did not receive instructions about the job hazard analysis. They also learned that the worker's required training did not include fall protection training.

A similar incident occurred at Y-12 in 2005, when a worker, who wore no fall protection, fell about 10 feet from the platform of a railroad tank car to the ground. The worker fractured one wrist, chipped a bone in the other, and fractured both his left and right orbital bones. In that event the worker had discussed the use of fall protection with his supervisor, but decided against it, as the worker believed he could maintain three points of contact and safely perform his work. Investigators determined that the direct cause of the event was the worker's failure to maintain three points of contact, as planned. (ORPS Report NA--YSO-BWXT-Y12SITE-2005-0002)

Investigators also identified the following judgments of need.

1. Evaluate whether to continue using the site requirement that permits three-point contact when working on tanker trucks.
2. Require a hierarchy of fall-protection options that includes (a) elimination of the hazard (i.e., work from the ground), (b) use of fixed or portable engineered fall protection, (c) use of PPE, and (d) administrative controls (e.g., procedures).

Figure 2-1. Vintage railroad tank car similar to the one in the recent Y-12 event

3. Ensure that procedures and training for elevated work address ladder safety. Topics should include using three points of contact as a control, selecting and using ladders, transitioning on and off ladders, and using dual-purpose equipment (i.e., platforms that also serve as a ladder rung).

OE Summary 2005-11 details the February 2005, event at Y-12 and the results of the investigation.

In addition to the recent incident at the Y-12 site, several other events involving working at heights without fall protection occurred across the Complex in 2008, including the following.

- On December 22, 2008, at Lawrence Livermore National Laboratory, a technician exited a caged ladder at the top of a 15-foot-high retention tank without wearing fall protection. The technician was trying to improve his view of float switches through a port at the top of the tank. An investigation is in progress. (ORPS Report NA--LSO-LLNL-LLNL-2008-0070)
- On July 22, 2008, at Pantex, a subcontractor installing roof support knee braces lost his balance, and his foot and elbow penetrated a sheetrock ceiling to the room below when one of his feet slipped off a ceiling joist. The worker caught himself on the joists and did not fall to the floor. The worker had been ordered to stop work and descend from the roof by the Project Subcontract Technical Representative, who saw him and another worker working without adequate fall protection in violation of the Activity Hazards Analysis (AHA). One worker was wearing his fall protection harness, but his lanyard was on the floor; the other worker, who was standing on a bridge-crane rail, was wearing a body harness with a lanyard, but he was not tied off. Investigators determined that the two workers did not follow the safety requirements in the AHA, although they had been briefed on it. (ORPS Report NA--PS-BWP-PANTEX-2008-0085)
- On June 18, 2008, at Sandia National Laboratory, a subcontractor foreman and journeyman climbed onto the top guard rails of a scissor lift to position a pipe in a pipe hanger (approximately 23 feet from the floor below) without fall protection equipment. The two workers were part of a crew installing a heating water pipe through a roof penetration. Because the crew was having difficulty positioning the pipe in the pipe hanger at the full height of the scissor lift (19 feet), the journeyman climbed to the top guard rail and the foreman climbed onto the middle rail to secure the pipe. When an observer saw them, work was suspended. Investigators learned that, although OSHA fall protection requirements were identified in the safety plan and the workers had received required OSHA training on fall protection requirements, the requirements were not implemented during work activities. (ORPS Report NA--SS-SNL-NMFAC-2008-0012)

The Department of Labor website reports that the standard associated with fall protection (29 CFR 1926.50) was one of the most frequently cited OSHA standards for fiscal year 2008. Of the top ten standards most frequently cited, fall protection ranked number two, and of the top ten standards for which OSHA assessed the highest penalties, fall protection ranked number one. (http://www.osha.gov/dcsp/compliance_assistance/frequent_standards.html)

Fall protection training is a crucial element of improving worker safety when tasks involve working at elevations. A senior safety and health professional for the Laborer's Health and Safety Fund of America (LHSFA) indicated that "[m]ost falls occur because of lack of fall protection" and that in "80 to 90 percent of falls, the worker was not wearing a harness." He also stated that there is "a significant lack of training about falls and a lack of commitment to stopping them."

All of the events discussed above involved either lack of fall protection training (as was the case in the recent Y-12 event) or workers not using fall protection when it was required. If workers do not recognize fall dangers, do not know how to use the equipment properly, or do not understand fall protection plans, then identifying the need for fall protection measures in hazard analyses or safety plans will not ensure that the potential for injuries or fatalities from falls is eliminated. It is essential to ensure that workers are not only properly trained, but that they understand their own responsibility for safely performing work tasks at elevations.

The textbox on the following page provides a list of questions about fall protection that workers should be able to answer before working at heights. Figure 2-2 shows workers at the Mixed Oxide (MOX) Fuel Fabrication Facility Construction Site at Savannah River using the correct fall protection for their work task.

OSHA fall protection training requirements are detailed in 29 CFR 1926.503, *Training Requirements*, which states that training must be provided to each employee who might be exposed to fall hazards and that the training must enable each employee to recognize the hazards of falling and the procedures to be followed in order to minimize these hazards. The requirements in 1926.503(c) state that retraining is required when "inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill." (http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10759)

These events demonstrate that, although safety plans and hazards analyses identify the need for fall protection, workers may not understand the necessity for adhering to stated fall protection requirements. It is essential that workers receive appropriate fall protection training that clearly identifies the dangers of falls (i.e., serious injuries and fatalities), proper use of fall protection equipment, and the need to follow fall protection plans. Retraining is required when it is determined that a worker has an inadequate understanding of fall protection requirements and equipment. Questioning workers about basic fall protection methods before work begins can help identify workers who may not have had training or have forgotten important elements of training.

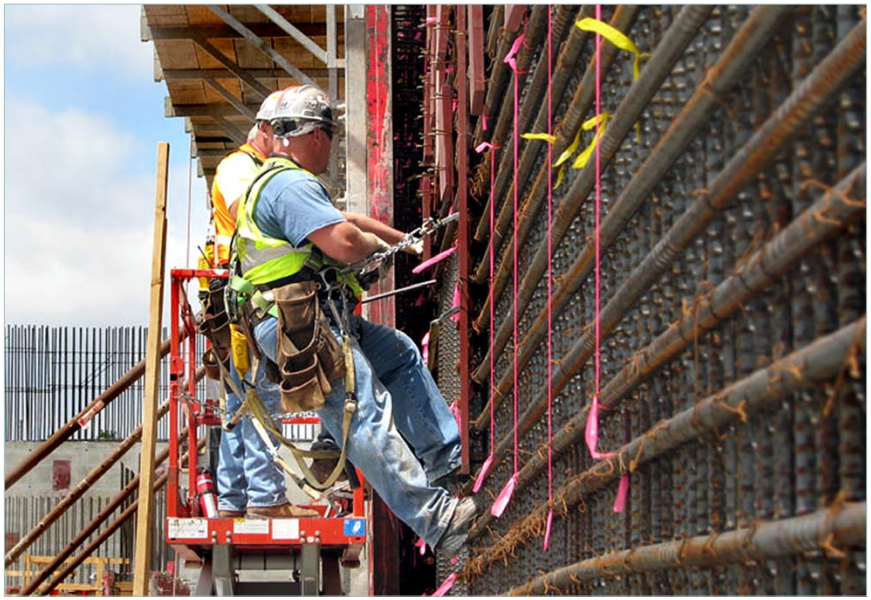


Figure 2-2. Workers at MOX wearing task-appropriate fall protection equipment

KEYWORDS: Fall protection, fall, near-miss, training, tank car

ISM CORE FUNCTIONS: Analyze the Hazards, Develop and Implement Hazard Controls, Perform Work within Controls

Can Workers Answer These Questions About Working at Heights?

1) What are the two basic types of fall protection?

- Fall restraint systems, like guardrails. These keep you from falling.
- Fall arrest systems, like safety nets. These break your fall.
- Never use any type of fall protection unless you have been trained.

2) If there are no guardrails, when should you tie off with a harness and lines?

- Tie off when the drop is 7½ feet or more.
- There are exceptions to the 7½ foot rule for some trades, like roofers and ironworkers.

3) When and where should safety nets be used?

- Safety nets should be used if it is not practical to tie off.
- Safety nets should be placed no more than 30 feet below the work area.
- Nets should extend from 8 to 13 feet beyond the structure you're working on.
- No work can proceed unless the net is in place.

4) If you use fall protection equipment, what do you need to check?

- Be sure all equipment is safety-approved. Look for a label showing that it meets American National Standards Institute (ANSI) safety requirements.
- Be sure the equipment is installed and used according to the manufacturer's instructions.
- Be sure everything is in good condition. Remove from service any lanyard or drop line that has broken someone's fall, or is frayed or worn.
- Be sure you have the right equipment for the job. For example, safety belts are not allowed in fall arrest systems.

5) Where should you place the anchor end of a lanyard?

- Anchor it at a level no lower than your waist. That way, you limit any fall to a maximum of four feet.
- Anchor it to a substantial structural member, or to a securely rigged catenary or pendant line.
- Do not anchor it to a pipe.

— *Taken from* http://www.cdc.gov/eLCOSH/docs/d0500/d000544/d000544.html

The Hazards of Pop-Up Vehicle Barriers 3

On July 7, 2008, at Lawrence Livermore National Laboratory (LLNL), a security guard inadvertently activated a pop-up barrier while a garbage truck was driving across it. The undercarriage of the truck was damaged and the driver was sent to a local hospital for evaluation. Investigators determined that the security barrier entry and exit procedures were inconsistent. The procedures were revised and the guard was retrained. (ORPS Report NA--LSO-LLNL-LLNL-2008-0052)

An analysis of similar onsite events indicated that pop-up barrier incidents have been a recurring issue at LLNL. In February 2007, site management filed an ORPS report indicating that a dozen pop-up barrier incidents resulting in scraped undercarriages and minor gasoline or oil spills had occurred over a 3-year period. Site management filed a second ORPS report on October 23, 2008, citing recurring events resulting from premature pop-up barrier activation.

There have been several similar incidents involving pop-up barriers across the Complex. On September 25, 2006, at Sandia National Laboratory, a pop-up barrier rose prematurely under a Security Captain's vehicle and suddenly dropped down. The Security Captain suffered back and neck pain, and the vehicle was slightly damaged. (ORPS Report NA--SS-SNL-4000-2006-0003)

Investigators identified operator error, inadequate communication of console modifications to operators, and inadequate operator training on the console as causes of this event. They learned that on at least two previous occasions the pop-up barrier had come in contact with vehicles. The first occurrence was before the barriers were officially put into operation and before operators had been trained. The installation contractor's trailer was lifted off the ground during procedure validation for the pop-up barrier, but the incident had been considered part of the "learning experience." In the second occurrence, a supply truck driven by a Security Police Officer was lifted 3 feet off the ground, then dropped, when the guard operating the barriers failed to follow procedures that required a second person to visually confirm vehicle clearance before the operator activated the barriers.

A root cause analysis indicated that the system had been installed so close to metal gates and fences that the ability of the sensors to detect vehicles was limited. The sensors had been set for minimum sensitivity to correct the limitation. Because the minimum setting created a weakness in the engineered control, an administrative control was put into place (i.e., a second person must confirm that a vehicle has safely cleared the barrier before it is activated), but the administrative control failed to prevent the occurrence.

Another pop-up barrier event, which occurred April 7, 2005, at the South Gate of the DOE Headquarters Germantown Campus, resulted in a limited scope accident investigation. When the driver of a commercial mail van stopped for a mandatory badge verification, the security guard checked the driver's badge, waved him forward, and pushed the button to activate the barrier DOWN. As the van pulled forward, the barrier came UP instead, and the van was stuck. To make matters worse, the gate arm came down on the hood of the van while it was immobile. The driver sustained a cut forehead when his head hit the steering wheel, and the van was not drivable because of significant damage to the front suspension (Figure 3-1).

Figure 3-1. DOE Headquarters pop-up barrier event

Immediately following the incident at the DOE Headquarters Germantown Campus, DOE published Safety Bulletin 2005-02, *Potential Problems with Active Vehicle Security Barriers*. It provided additional information on the accident and asked sites to report their pop-up barrier deficiencies and corrective actions. The Safety Bulletin is available at http://www.hss.energy.gov/CSA/csp/safety_bulletins/SB_2005-2.pdf.

Tests on the four barriers at the gate indicated that none of the safety loops used to immobilize the barrier was functional. Investigators determined that the safety loops had not been correctly installed and that some switches were not positioned to work as designed. They also learned that NBI (the manufacturer and installer) recommended performing a traffic safety study before installing the barriers and had documented that recommendation in their disclaimer. However, because responsibility for the traffic study was not clearly assigned, it was never performed. Interestingly, the investigation report stated that 12 events involving vehicles and the barrier system had been documented during the 9 months the system had been in place. Investigators concluded that adequate procedures and training, analysis of previous events, and communication of lessons learned would have helped prevent the April 2005 event.

A pop-up post as small as 3.5 inches in diameter and 30 inches high will stop a 2-ton vehicle traveling 15 miles per hour; a 14-inch-diameter, 36-inch-high post will stop a vehicle traveling 50 miles per hour. A dramatic example of pop-up barrier efficiency occurred in March 2006, at Davis-Monthan Air Force Base in Tucson, Arizona, when a vehicle attempted to enter a gate at a speed of 50 miles per hour. Figure 3-2 shows the barrier in the down position, and Figure 3-3 shows the vehicle stopped in its tracks by the pop-up barrier, which performed exactly as designed. The two armed and intoxicated occupants were injured in the crash. After being hospitalized for treatment, they were jailed on a variety of charges.

Even if a car is moving slowly, the force exerted by a barrier popping up under it can deploy the airbags and injure the occupants. On December 11, 2008, on the Dillon Dam Road in Summit County, Colorado, automated pop-up barriers deployed and damaged a passenger vehicle. The barriers had been installed after the Denver Water Board, which has responsibility for the dam, determined that the dam faced unspecified threats. The pop-ups are designed to activate and stop only a large truck or other potentially threatening vehicle on the restricted roadway, while allowing lighter, passenger vehicles to drive over them unimpeded. When the barrier activated unexpectedly as the passenger vehicle passed over it, the impact deployed

Figure 3-2. Pop-up barrier in down position at Davis-Monthan Air Force Base

Figure 3-3. Pop-up barrier stops vehicle

the vehicle airbags, injuring the driver. Fortunately, traffic was moving at 5 miles per hour or the damage would have been significantly worse and might have resulted in serious injuries or even a fatality (*Summit Daily News*, December 12, 2008). Figure 3-4 shows the aftermath of the incident.

No guidance is currently available for the design, operation, and maintenance of active vehicle barriers. However, the American Society for Testing and Materials (ASTM) is developing ASTM-WK10277, *New Standard Guide for Active Vehicle Barriers for Homeland Security Applications*, which will help identify standard specifications, testing, practices, and guides for active vehicle barriers. The guidance is expected to address selection, resistance, operations, safety markings and devices, ancillary equipment, and maintenance.

Figure 3-4. Automated pop-up barrier malfunction in Colorado
(Credit: *Summit Daily News*, used with permission)

These events illustrate the importance of testing equipment, walking down operational procedures, and training operators before security barriers become operational. After barriers are installed, operators must never become complacent about the dangerous consequences of the equipment they operate and should be re-trained on configuration changes. Vehicle operators (both DOE employees and commercial operators) must be alert when encountering pop-up barriers and should drive over them slowly to lessen damage should a pop-up inadvertently activate.

KEYWORDS: Pop-up barrier, security

ISM CORE FUNCTIONS: Analyze the Hazards, Develop and Implement Hazard Controls, Perform Work within Controls, Provide Feedback and Continuous Improvement

Bicycle Safety Onsite and in Your Neighborhood

4

Several sites across the Complex provide bicycles to employees to allow them to get from place to place around the site when it is difficult to drive to an area or when parking is unavailable. Although riding a bicycle is not inherently dangerous, three bicycle accidents that resulted in injuries were reported to ORPS in 2008. Two of the accidents occurred at Lawrence Livermore National Laboratory (LLNL) and one at Sandia National Laboratories (SNL). All three of the workers involved in these accidents suffered broken bones.

The most recent bicycle accident occurred at LLNL on December 15, 2008. A subcontract employee was riding a Laboratory-provided bicycle from one building onsite to another when he crashed the bicycle. Site fire department personnel responded to the accident and transported the worker to an offsite medical facility, where it was confirmed that he had sustained a fracture to his lower leg. Investigation into the cause of this event is ongoing. (ORPS Report NA--LSO-LLNL-LLNL-2008-0064)

An earlier accident involving an LLNL-provided bicycle occurred on February 6, 2008. While riding a bike to a meeting, a worker attempted to make a sharp turn, fell off the bike, and sustained a pelvic fracture. The worker transported herself home shortly after the accident, and the fracture was diagnosed by her personal physician on the following day. The worker said she was concentrating on work while riding and did not see a bend in the path until it was too late to adjust for it. (ORPS Report NA--LSO-LLNL-LLNL-2008-0007)

Investigators determined that there were no deficient conditions that contributed to the accident. The pathway was free of hazards, and the worker told them that there were no deficiencies with the bicycle. The worker simply had a mental lapse because she was focused on work-related issues rather than on the path ahead of her.

The SNL accident, which occurred on September 24, 2008, also resulted from a mental lapse. The rider struck a parking bumper that was slightly out of position, fell from his bike, and hit the asphalt pavement. Paramedics transported him to a local hospital where he was diagnosed with a fractured right hip. The worker stated that he was focused on the upcoming activities of the day and did not keep his eyes on the path he was traveling. (ORPS Report NA--SS-SNL-1000-2008-0013)

It's easy to crash on a bicycle. Based on statistics gathered from 2002 through 2007, about 540,000 injured bicyclists visit emergency rooms every year. Of those, about 67,000 have head injuries, and 27,000 have injuries serious enough to be hospitalized (http://www.bhsi.org/stats.htm). Bicycle crashes and injuries are generally under-reported since the majority are not serious enough for emergency room visits. It is estimated that about a million people have sought treatment from their personal physicians following accidents involving bikes.

Injuries can happen anytime, anywhere. They can occur in your neighborhood or, as the events at LLNL and SNL show, while using a bicycle to travel from place to place on a DOE site. It is important to follow some basic safety rules to avoid accidents and to decrease the chances that you will be seriously injured. Information on bicycle safety compiled by the DOE Office of Occupational Medicine can be accessed at http://www.hss.energy.gov/HealthSafety/occmed/bicyclesafety.html.

The following information and safety tips come from a variety of sources, including the National Highway Traffic Safety Administration (NHTSA).

Follow the Rules of the Road

According to NHTSA statistics, 698 cyclists were killed and an additional 43,000 were injured in traffic crashes in 2007. Cyclist deaths accounted for 2 percent of all traffic fatalities, and cyclists made up 2 percent of all those injured in traffic crashes during 2007.

While most of us do not consider riding a bicycle to be an especially dangerous activity, it is important to take steps to maintain safety. Cyclists on public streets have the same rights and responsibilities as automobile drivers and are subject to the same rules and regulations as any other vehicle on the road. The safest way to operate a bicycle is to follow the rules applicable to motorists. Additional tips on navigating safely when riding your bicycle, including a video on bicycle safety for adults and downloadable brochures, can be found at the NHTSA site at http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.810acaee50c651189ca8e410dba046a0.

The following tips come from the California Department of Transportation site, which can be accessed at http://www.dot.ca.gov/dist9/bicycle/safty_tips.html.

- Most bicycle riding is done on roads and streets shared with motor vehicles. For your safety and the safety of others, obey the rules of the road as if you were driving a car—stop at stop signs and red lights, and signal before turning or changing lanes.
- Always ride on the right side of the road. Stay in single file and as far to the right as practical. It is both dangerous and illegal to ride on the left side of a two-way highway.
- Be extremely cautious when traveling through intersections. Be aware of traffic around you, and be prepared to brake quickly.
- Avoid traveling along the side of cars when passing through intersections—they may turn in front of you without warning.
- When riding in a central business district, use extreme caution when passing parked cars, as occupants may not see you when opening doors or pulling out of parking spaces.
- Keep your hands on the handlebars at all times. Riding with no hands does not permit you to stop or to avoid hazards (e.g., potholes, broken glass, cars).
- Yield to all pedestrians. They cannot foresee a dangerous situation as well as you can and may be inattentive.
- Remember, your bicycle is a small, inconspicuous vehicle. It is not easily seen on crowded streets. Do everything you can to make sure you are noticed.
- Use proper hand signals (the same ones you would use when driving).

Wear a Helmet

Broken bones heal, but a head injury can lead to death or permanent disability. Each year, nearly 70,000 bicyclists suffer serious head injuries. Many never fully recover. Every bicyclist needs the protection that a good bicycle helmet provides. (Figure 4-1 shows the proper way to wear a helmet.)

The following statistics show the dangers of riding a bicycle without a helmet.

- One in eight of the cyclists with reported injuries following an accident had a brain injury.

- Two-thirds of the deaths that occur as a result of a bicycle accident are from traumatic brain injury.
- A very high percentage of cyclist brain injuries can be prevented by a helmet (estimated at anywhere from 45 to 88 percent).
- Direct costs of cyclists' injuries due to not using helmets are estimated at $81 million each year, rising with health care costs.

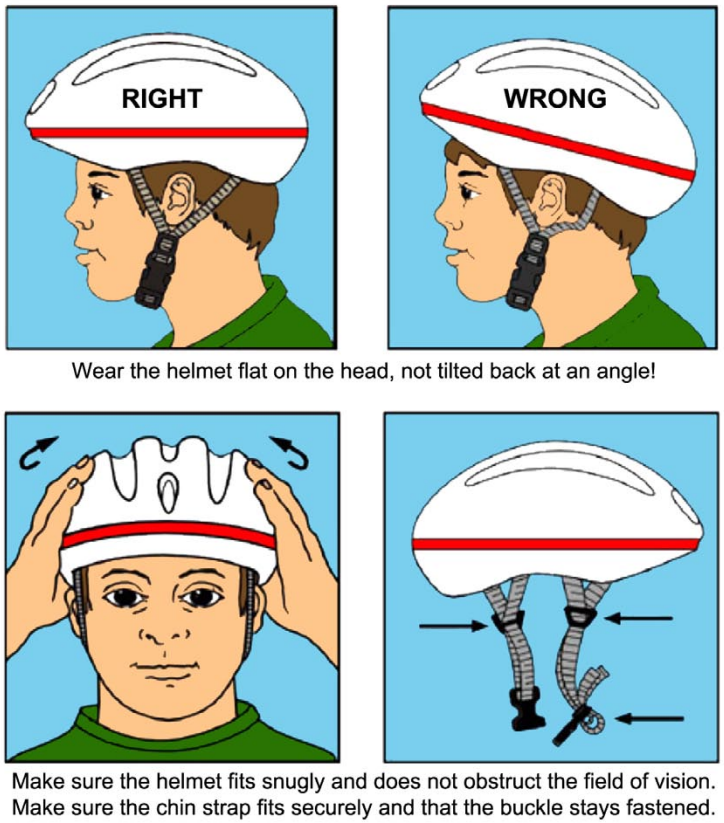


Figure 4-1. Correct way to wear a bicycle helmet

Wearing a helmet will not keep you from falling, but it can decrease the chances of serious brain injury. Researchers say that bicycle helmets can prevent three out of four serious cycling head injuries.

Stay Focused

It is just as important to be aware of your environment when you are riding a bike as it is when driving a car. It is essential to focus on the path ahead of you so you can prepare for hills and road obstacles. Some common obstacles that can cause falls include wet leaves, large puddles, changes in the road surface, storm grates, gravel or rocks, curbs, and, in the case of the accident at SNL, parking bumpers. The NHTSA makes the following recommendations to help maintain focus while cycling.

- Never wear headphones—they hinder your ability to hear traffic.
- Always look for obstacles in your path (potholes, cracks, expansion joints, railroad tracks, wet leaves, drainage grates, or anything that could make you fall).
- Before going around any object, scan ahead and behind you for a gap in traffic, signal your intentions to move, then follow through with your intentions.
- Be aware of the traffic around you and ride defensively.

Maintain Equipment

Proper maintenance is an important element of safe cycling. DOE sites that provide bicycles for quick transport around the site generally have bicycle maintenance programs and check bikes to make sure they are in good working order on a regular basis. However, with so many riders taking bicycles from one area of the site to another, the bike you choose may not be in perfect working order. A pre-ride check before heading across the site will alert you to any potential problem areas. Making

some basic preliminary checks will probably take you less than 30 seconds and only requires a visual inspection of the main components on the bicycle. The textbox provides a checklist that will make sure you have addressed any potential safety issues.

To keep your personal bike in top working order, make it a habit to perform the following maintenance checks before you ride (taken from About.com at http://bicycling.about.com/od/allaboutyourbike/a/five_bike_check.htm).

- Tires and Wheels – Before you get on your bike, check your tires to make sure they are properly inflated. Take a quick look all the way around for places where the rubber might be cracked, gouged, or worn. Check the nuts or quick-release mechanisms that hold your wheels in place. Verify that your wheels are securely fastened so they don't come out while riding.
- Brakes – Squeeze your brake levers to make sure that they apply enough pressure to stop your bike and that you don't have any problems with fraying or stretched cables. Check the brake pads in the front and back to be sure they are hitting only the rims.
- Seat Post and Handle Bar Stem – Check to make sure that your handle bar stem is fastened tightly and that your seat is set at the correct height.
- Chain and Gears – Check that the chain turns cleanly through your front and rear sprockets and doesn't rub against the derailleur. (Do this as you pedal when you first set off.) At the same time, quickly run your bike through its range of gears to make sure there are no problems with rough shifting or chain slippage and that the drive train is free from excessive grime and doesn't need lubrication.

Ensuring that all safety elements have been addressed, whether riding a bicycle across a DOE site or around your neighborhood, just requires adhering to some simple rules: pay attention to your environment while riding; keep your bike in good working order; follow the rules of the road; and always wear a helmet so that your head is protected should you crash.

As the events at LLNL and SNL show, it is important to take all necessary precautions when riding a bicycle not only to prevent an accident, but to protect yourself should an accident occur. Wearing a helmet any time you ride is the most important safety measure you can take, as it can help you avoid a serious or even fatal head injury. It is also important to ensure that your bicycle is well maintained and to check the basic mechanics before you ride. When cycling, always follow the same rules of the road that drivers of motor vehicles must follow, and stay focused on the environment around you to avoid any obstacles in your path.

Pre-Ride Checklist

- Check the tires for proper inflation (marked on the side of the tire). Check the tire treads for excessive wear or other damage, such as embedded glass or other objects.
- Check the brakes. Spin the wheels to check for rubbing and then apply the brakes to ensure they stop the bike smoothly and evenly. Check the brake pads for excessive wear.
- Check the cables and housing to make sure there is no fraying or splitting.
- Check the wheel quick release levers to ensure they are secure.
- Check for any loose parts or other mechanical problems.
- Do a slow-speed ride and inspect bicycle, brakes, and shifting before you leave your driveway.

KEYWORDS: Bicycle, injury, bicycle safety

ISM CORE FUNCTIONS: Analyze the Hazards, Develop and Implement Hazard Controls

The Office of Health, Safety and Security (HSS), Office of Analysis publishes the Operating Experience Summary to promote safety throughout the Department of Energy (DOE) complex by encouraging the exchange of lessons-learned information among DOE facilities.

To issue the Summary in a timely manner, HSS relies on preliminary information such as daily operations reports, notification reports, and conversations with cognizant facility or DOE field office staff. If you have additional pertinent information or identify inaccurate statements in the Summary, please bring this to the attention of Dr. Robert Czincila, (301) 903-2428, or e-mail address Robert.Czincila@hq.doe.gov, so we may issue a correction. If you have difficulty accessing the Summary on the Web (http://www.hss.energy.gov/csa/analysis/oesummary/index.html), please contact the Information Center, (800) 473-4375, for assistance. We would like to hear from you regarding how we can make our products better and more useful. Please forward any comments to Robert.Czincila@hq.doe.gov.

The process for receiving e-mail notification when a new edition of the OE Summary is published is simple and fast. New subscribers can sign up at the Document Notification Service web page: http://www.hss.energy.gov/InfoMgt/dns/hssdnl.html. If you have any questions or problems signing up for the e-mail notification, please contact Dr. Robert Czincila by telephone at (301) 903-2428 or by e-mail at Robert.Czincila@hq.doe.gov.

Commonly Used Acronyms and Initialisms

Agencies/Organizations	
ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
CPSC	Consumer Product Safety Commission
DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
INPO	Institute for Nuclear Power Operations
NIOSH	National Institute for Occupational Safety and Health
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration

Units of Measure	
AC	alternating current
DC	direct current
mg	milligram (1/1000th of a gram)
kg	kilogram (1000 grams)
psi (a)(d)(g)	pounds per square inch (absolute) (differential) (gauge)
RAD	Radiation Absorbed Dose
REM	Roentgen Equivalent Man
TWA	Time Weighted Average
v/kv	volt/kilovolt

Job Titles/Positions	
RCT	Radiological Control Technician

Authorization Basis/Documents	
JHA	Job Hazards Analysis
JSA	Job Safety Analysis
NOV	Notice of Violation
SAR	Safety Analysis Report
TSR	Technical Safety Requirement
USQ	Unreviewed Safety Question

Regulations/Acts	
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DD&D	Decontamination, Decommissioning, and Dismantlement
RCRA	Resource Conservation and Recovery Act
TSCA	Toxic Substances Control Act

Miscellaneous	
ALARA	As low as reasonably achievable
HEPA	High Efficiency Particulate Air
HVAC	Heating, Ventilation, and Air Conditioning
ISM	Integrated Safety Management
MSDS	Material Safety Data Sheet
ORPS	Occurrence Reporting and Processing System
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
SME	Subject Matter Expert