



Utilities Branch
The Utility Connection
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It is hard to believe that the end of 2011 is fast approaching. It seems like just yesterday we were in Chicago celebrating ASSE’s 100th anniversary. Well, almost four months have passed and the holiday season is upon us again. For me, this year has zipped by. If you do not put together a plan, the next thing you know you will be sitting in front of the television watching the Super Bowl wondering where it all went.

In my last message, I spoke of the need for a plan and that the Advisory Committee is working on a strategic plan for the Utilities Branch. I am pleased to say that a second draft of that document has been completed and will be reviewed during our upcoming conference call. It is my hope that we will finalize the plan soon.

The Advisory Committee meets on a monthly basis via teleconference. Since this organization is yours and not the committee’s, as of October, we opened our monthly meetings to the membership. The next call is **November 17, 2011 at 2:30pm central** ((308) 344-6400, passcode: 986477#). Those members who have provided us with their e-mail address will also receive a reminder before the call.

Continuing on my theme of planning and the approaching holidays, it is time to break out those time-worn inclement weather training programs for driving and working in hazardous conditions, including rain, sleet, snow and icy conditions. For those of you who have employees who may work at elevation, slippery walking/working surfaces happen much faster than on the ground making that work all the more treacherous, emphasizing the need for our people to use the 100% fall protection systems we continue to push.

Beyond the workplace, our fellow workers are exposed to additional hazards related to the holidays: children going door to door in the neighborhood trick or treating, holiday parties at work and home and the stress of the season. This is an opportunity for us to remind employees not to over indulge (food and alcoholic beverages) and to keep themselves and their families safe during the holidays.

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Welcome New Members!



We want to thank everyone who has remained a loyal member of the Utilities Branch and welcome the following members who recently joined. We are currently at 422 members and growing. If you have any colleagues who might be interested in joining the branch, please contact [Krista Sonneson](#) to request an information packet. If you know anyone who might be interested in joining ASSE, please contact [customer service](#).

Angela Ahmad, PECO Energy Co.
 Ali Ahmad Musanada
 Ahmed Al Naqbi, Abu Dhabi Co. for Onshore Oil Operation
 Kelly Albamonti, Westinghouse Electric Co.
 Tristan Aldeguer, DCK Worldwide
 Thomas Ankrum, Rizzani De Eccher USA
 Raymond Antonelli
 Steven Apicelli, SMUD
 Russell Barringer, Arizona Public Service Co.
 Ric Beyler
 Thomas Birkett, Cosco Fire Protection
 Jeffrey Blomgren, Petticoat Schmitt Civil Constructors Inc.
 Gerald Bowers, Global Safety Management
 John Brandquist
 Allen Brooks, Insurance Planning
 Regis Collins
 Stephen Cox
 Kenneth Custer
 James Drake
 Raymond Enama
 Mike Escobedo
 Robert Eubanks
 B. Dean Fisher, Administaff
 Christopher Flegel, Vic's Crane & Heavy Haul, Inc.
 Carl Ford, Total Safety Consulting
 Frederick Gerdts, MidAmerican Energy Holdings
 Kimberly Goss, Interstate Restoration LLC
 Warren Graves, Team Fishel
 William Halkovitch, Harsco Infrastructure Americas

Steven Harkin, Pacificorp
 Cynthia Harvey
 Robert Hayden, Lincoln Electric Systems
 Todd Hohn, PureSafety
 E. Tim Holden
 Donald Hubal, C.S.I. Certified Safety Inspection
 Larry Hudson, Ruby-Collins
 Malcolm Jacobs, TolTest Inc. Health Safety
 Carolyn Jones, San Francisco Public Utilities Commission
 John Kasanicky
 Gary Keith
 James Kridler
 George Land, Zurich Services
 Daniel Lavoie, Liberty Mutual
 Edward Leo, Xcel Energy
 Robert Levens, National Safety Consulting
 Michael Listello
 Edgar Lopez
 Margo Maher, Associated General Contractors NM Building Branch
 Larry McFarland, TVA
 Sam Meland
 Paul Mikolaycik, AES Corp.
 Joel Molander, Puget Sound Energy
 James Morehead
 Sharon Mount
 John Mroszczyk, Northeast Consulting Engineers
 Darren Muljo
 Orrin Nay, UniSource Energy Corporation
 Kimberly Ohl, Roto-Rooter Services Co.
 David Parsons, Fred Shearer & Sons Inc.
 Mark Passamani, Casitas Municipal Water District
 Hannah Perry, Tennessee Valley Authority
 Jeffrey Pinkton
 Jasmine Powers, RES Americas
 William Ramsey
 Joshua Retzleff
 Joseph Rickson
 A.B. Robinson, LeChase Construction
 Russell Rogers, Foster Wheeler
 Walter Russell
 Douglas Sams, Carl A. Nelson Co.
 Adam Schremser, Henkels & McCoy
 Phillippe Seib
 Domino Smotrys, Southern California Edison
 G. Calvin Sparks, Liberty Mutual
 David Tamplin
 David Toler, Forensic Engineering Sciences
 Fred Toler
 Daniel Toussaint, Oryx Insurance Brokerage Inc.

Wendy Watkins, Knoxville Utilities Board
Gregory Webb, Aubrey Silvey Enterprises
Matthew Wiesehan, Utilimap

Inside Wind Towers

By Nick Nichols

A consistent safety hazard and OSHA violation issue currently exists in most, if not all, modern commercial wind turbine towers in the U.S. This subject addresses specific hazards to workers while climbing fixed ladders.

The issue defines needed retrofit services inside commercial wind towers to properly address the hazards and violations. Ultimately, the retrofit would protect the worker.

The issue encompasses wind industry safety, OSHA education and applicable regulations, engineered safety controls, NIOSH's Prevention through Design (PtD) and risk management. Addressing the issue requires industry education and acknowledgement of OSHA-defined hazards and a proactive mindset.

The hazards are permanent obstructions that protrude from the inside of the tower wall in very close proximity to the climbing side of fixed ladders. The hazards occur at every point where there is either a tower wall flange (bolted junction), conduit shelf or any other protruding permanent or unavoidable obstruction.

These obstructions protrude into the worker's protected climbing area (an area that OSHA defines with clearance requirements for worker's safety). The hazards cause workers to face the problem of a lack of bodily protection in areas of blind movement relative to structural members.

Workers are exposed to these hazards and OSHA violations every time they climb an internal fixed ladder inside a wind tower that does not meet required clearances for climbing.

OSHA regulations and illustrations under 1910.27, Fixed Ladders, define minimum clearances from fixed ladders to the "nearest permanent object" on the climbing side of the ladder. OSHA states there shall be no potential hazards within 24", and any

potential hazards within 30" must be fitted with a deflection device.

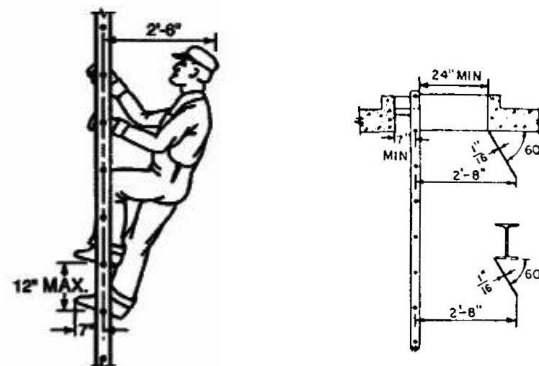


FIGURE D-5.—Deflector Plates for Head Hazards

Workers are subject to possible lacerations, bruises and coccyx, back and neck injuries from these exposed hazards. A slip by a worker just above one of these hazards could potentially lead to a career-ending injury if the worker were to contact the hazard before all of the slack in his or her fall protection equipment was taken up. A deflection device would allow the worker in the same circumstance to simply slide over and around the hazard.

These hazards have become even more dangerous with the widespread installation and use of climb assists. Workers now have the ability to travel up and down the ladder at a much quicker speed. Climb assists allow workers to basically rappel down the ladder at very high speeds, presenting greater risk to their tailbone and back.

These hazards also present additional safety interference issues during an assisted rescue inside the tower. If a worker became incapacitated on the internal fixed ladder and required an assisted rescue, that worker would be subjected to the dangers and snag hazards of the unprotected protruding obstructions. This fact alone could make an assisted rescue impossible without additional help. The snag hazards could also greatly increase the time that suspension trauma is applied to the injured worker.

New workers in the wind industry not familiar with climbing towers, especially while using a climb assist, are at even higher risk of receiving injuries.

Communications and consultations with applicable authorities and safety professionals in charge of wind tower installments reveal that the industry seems to be very unclear regarding the risks, application and/or treatment of these hazards, regulations and violations.

These untreated hazards indicate that most commercial wind turbine towers in the U.S. have not yet been properly inspected for OSHA and/or North American safety standards.

(Note: The word “potential” is underlined throughout this article for two reasons. First, OSHA clearly states “potential hazards,” not “proven hazards”. Second, due to an attitude within the industry that since no one has been injured by these protruding obstructions yet, they are actually not a hazard at all.)

Through our experiences working in many different wind towers across the U.S., and while taking these hazards into consideration as well as into our bodies, we decided to research this issue, which snagged our attention as well as our safety equipment. We researched and gathered facts on these obvious design hazards, trying to learn how they could go so consistently unchecked in the towers.

With facts and findings guiding us, as well as announcements that OSHA intends to start looking closer at wind industry safety, we determined there was a real need for a practical device that would address not only the hazard for the worker, but also provide for OSHA compliance. With organizations like the American Wind Energy Association forming alliances with OSHA, we would hope the industry will become more aware of and open to improved technology in safety for wind turbines.

We did not create the hazards. We did not create the regulations. We just looked at the situation and took the initiative to develop a solution that protects the worker, while providing OSHA compliance.

Our solution is currently on file with a utility patent pending at the U.S. Patent and Trademark Office.

We submitted our research and development as a good working example of NIOSH’s PtD. We submitted our solution as an example of a useful engineered safety control for risk management. This article demonstrates our work and contribution toward growth and increased safety within the wind industry.

Preventative safety measures in the workplace should include the use of both portable and permanent equipment.

It is common practice that wind industry workers always use portable PPE to help prevent injuries in the workplace.

In the same manner, exposed permanent hazards in the workplace should always use permanent protective equipment whenever possible and wherever required. Both proactive measures used together will better serve to protect workers from preventable injuries.

Technical Facts & Findings

Standard designs in modern commercial wind turbine towers produce exposed protruding hazards (permanent obstructions) as close as 22"-24" to the centerline of fixed ladders on the climbing side. However, applicable OSHA regulations clearly state that there shall be no protruding potential hazards within 24" of the centerline of ladders and that any such hazards within 30" must be fitted with a deflection device.

Wind turbine maintenance typically falls under OSHA general industry regulations. OSHA covers these protruding hazards under general industry regulations 1910.27(c)(1), 1910.27(c)(7) and 1910.27(d)(1)(vi).

OSHA also covers these hazards for construction time under regulations 1926.1053(a)(14) and 1926.1053(a)(15).

There is a general lack of acknowledgment and understanding throughout the wind industry regarding these specific hazards and the applicable OSHA regulations that govern them. Our research also uncovers OSHA regulation definitions and illustrations that are not well-correlated for clarity regarding this issue.



Through talking with industry safety professionals, we have found that some believe their wind towers are considered "smooth-walled wells" (which they are not), and therefore exempt from the requirements of 1910.27(c)(1) and (7). Others believe that as long as the tower wall is at least 30" from the center line of the ladder, they are in compliance regardless of any other protruding obstructions. Both of those instances are incorrect (<http://www.osha.gov/Publications/ladders/osha3124.html>).

Regarding smooth-walled wells, OSHA Figure D7 under 1910.27 illustrates clearances in smooth-walled wells. Figure D7 clearly shows that even in a smooth-walled well, "other obstructions" still require 30" of clearance from the centerline of fixed ladders. Wind turbine towers do not meet the requirements for smooth-walled wells, as wells must be free of projections, as found in OSHA Publication 3124-12R 2003—Stairways and Ladders; Wells for Fixed Ladders.

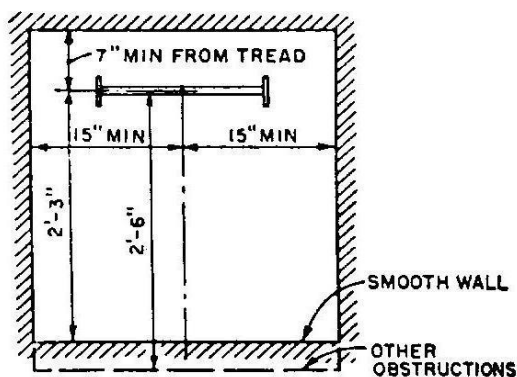


FIGURE D-7.—Cages for Ladders More Than 20 Feet High

Regarding the tower wall clearance of 30", OSHA regulation 1910.27(c)(1) actually requires the climbing side of fixed ladders to have a clearance of 30" from the "nearest permanent object." However, OSHA also states that any potential hazards within 30" must be fitted with deflection plates or deflection devices to guide employees around the obstruction.

Our research and development revealed one possible reason for the confusion of clearances and compliance of the tower wall vs. protruding hazards. The confusion lies in not completely and

clearly recognizing and or interpreting 1910.27(c)(7).

The requirements for "any protruding potential hazard within 30" of a fixed ladder" is somewhat buried in the mix with the wording and requirements for "hatch covers" also covered under 1910.27(c)(7) ([http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27\(c\)\(7\)](http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27(c)(7))).

In our opinion, the following statements currently under 1910.27(c)(7) would provide more clarity if also included within section 1910.27(c)(1):

"There shall be no protruding potential hazards within 24" of the centerline of rungs or cleats; any such hazards within 30" of the centerline of the rungs or cleats shall be fitted with deflector plates placed at an angle of 60° from the horizontal as indicated in Figure D-5."

([http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27\(c\)\(1\)](http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27(c)(1))).

A final critical element we found in the clarification process points to Figure D2 under 1910.27, which clearly illustrates the required clearance for a worker on the climbing side of a fixed ladder. However, the link for Figure D2 is currently only found under 1910.27(b) "specific features." Figure D2 should also be listed under 1910.27(c) "Clearance." This is unfortunate because Figure D2 tells you all you need to know, and we believe many people never see it.

The climber on the ladder in Figure D2 should also be included with Figure D5 for further clarification purposes

([http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27\(c\)\(1\)](http://www.osha.gov/pls/oshaweb/owadisp.showdocument?p_table=STANDARDS&p_id=9719#1910.27(c)(1))).

wind turbines (current under a Utility Patent Pending).

Nichols began working in the wind industry in 2008. He has worked all over the country in many different brands of wind towers. Over the course of that time, he has been involved with projects requiring extensive and repeated climbing on fixed ladders inside towers from bottom to top. His research and development to address a widespread safety hazard and OSHA violation in wind towers has been acknowledged by NIOSH to be a useful solution representative of NIOSH's Prevention through Design.

Before getting involved in the wind industry, Nichols worked as a network administrator for a security company. He also has extensive experience in the automotive industry as an ASE-certified master automotive and diesel engine technician.

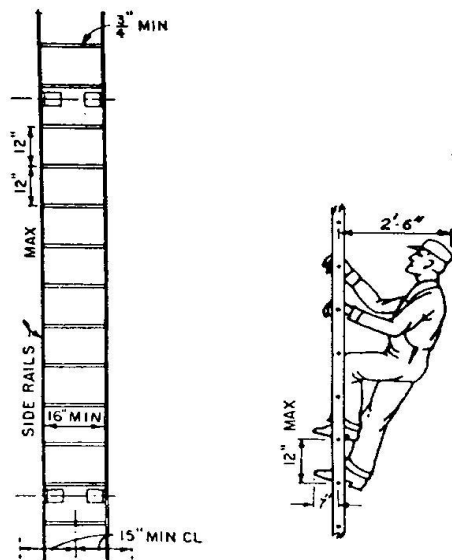


FIGURE D-2.—Rail Ladder With Bar Steel Rails and Round Steel Rungs

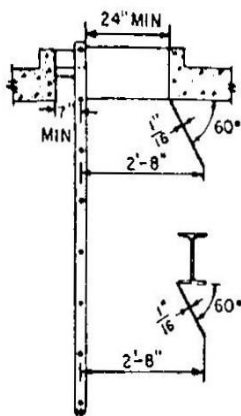


FIGURE D-5.—Deflector Plates for Head Hazards

A letter of interpretation for regulation 1910.27(c)(1) and its application to wind towers is currently pending with OSHA.

Click [here](#) to see a climb inside a wind turbine.

The author is not an engineer. The contents of this article are based on actual field experience as well as research and development while working in wind towers throughout the U.S.

Nick Nichols is co-founder of Pinnacle Wind USA, and co-inventor of the Tower Transition Slide for

Update: A10.21-201x

ASSE expects to circulate an official draft of the standard, "Safe Construction and Demolition of Wind Generation/Turbine Facilities" (A10.21-201x), for public review by the end of the year. The American Wind Energy Association has been a primary force behind this standard.

ASSE's A10 Accredited Standards Committee (ASC) has initiated this standard project to protect the safety and health of workers involved in construction and demolition operations for wind generation/turbine facilities.

"The committee decided to develop this standard because of the national emphasis on green energy, recognizing that thousands of these 'green' structures will be built and as such present challenging safety and health issues," says A10 Committee Chair Richard King. "The purpose of the new standard is to sort out the safety and health issues and to provide practical solutions to constructors."

During the A10 ASC's January 2009 meeting, the committee approved the A10.21 subgroup to develop the standard. Ryan J. Jacobson, P.E., manager of wind energy services for Black &

Veatch, serves as subgroup chair and Walter A. Jones, M.S., associate director, occupational safety and health for Laborers' Health & Safety Fund of North America, serves as the A10.21 liaison.

Safety and health issues of concern during construction and demolition of wind generation/turbine facilities that the A10.21 subgroup addresses in the development of the standard include working at heights, mechanical assembly of large components, medium-voltage electrical safety and working in exposed environments. The subgroup is citing and recognizing other existing voluntary national consensus standards in the development process.

In addition, major construction tasks in a wind project to be considered include wind turbine assembly and erection; civil construction (roads and pad clearing); structural construction (foundations); placement of electrical collection system (buried medium-voltage lines); and substation and transmission line construction. Major activities that will also be discussed include wind turbine generator component offloading; site staging; base tower section placement, which could include anchor bolt tensioning, leveling and grouting; tower assembly; nacelle placement; rotor assembly (typically on the ground); rotor placement; and mechanical completion and commissioning.

A10.21 Scope

The A10.21 standard establishes the minimum requirements for protecting the safety and health of persons involved in construction and demolition operations addressing wind generation/turbine facilities.

Major construction tasks on a wind project would be:

- Wind turbine assembly and erection
- Civil construction (roads and pad clearing)
- Structural construction (foundations)
- Placement of electrical collection system (buried medium voltage lines)
- Substation and transmission line construction

Activities:

- WTG component offloading
- Site staging
- Base tower section placement (could include anchor bolt tensioning, leveling and grouting)
- Tower assembly
- Nacelle placement
- Rotor assembly (typically on the ground)
- Rotor placement
- Mechanical completion and commissioning

Underwriter Laboratories Wind Projects

BSR/UL 6141-200x, Standard for Safety for Wind Turbine Generating Systems—Large

Large wind turbine generating systems (WTGS) are defined as wind turbines with a rotor-swept area larger than 200 m² (16 m rotor diameter). Large WTGS consist of various electrical hardware subassemblies and safety-related control systems constructed and interconnected in accordance with electrical safety requirements to create a complete wind turbine.

BSR/UL 6142-200x, Standard for Safety for Wind Turbine Generating Systems—Small

Small wind turbine generating systems (WTGS) are defined as wind turbines with a rotor-swept area larger than 200 m² (16 m rotor diameter) or less and an output terminal voltage of 600 V or less.

BSR/UL 6171-200x, Standard for Safety for Wind Turbine Converters and Interconnection Systems Equipment

Covers wind turbine converter (WTC) products and assemblies. Some of the features and functions of these products include, but are not limited to, generation of real and reactive power in parallel with the electric power system, EPS (electric utility grid), supplying power in a standalone operational mode, multiple mode operation and bidirectional power flow operation within the EPS. Requirements also address wind turbine utility interconnection systems equipment that performs utility interconnection protection functions for paralleling wind turbines with the EPS.

Resource Snapshot

Utilities Information: www.asse.org/ps/utilities
 Technical Resources: www.asse.org/ps/resources
 Body of Knowledge: www.safetybok.org
 Networking Opportunities: www.asse.org/connect
 Publication Opportunities: www.asse.org/ps/write
 Volunteer Opportunities: www.asse.org/ps/volunteer

Cooling Weather is Hazard for Laborers

By Janet Lubman Rathner

Everyone knows that heat and cold can kill. But for Laborers who work outdoors, it is the days between steamy summer and frigid winter that can be especially treacherous.

Autumn weather is an invitation for cold stress and related, serious health conditions like hypothermia, frostbite and trench foot. Minus the temperature extremes of summer and winter, which serve as reminders to dress appropriately, take rest breaks and limit exposure to the elements, autumn creates a false sense of security about weather. Such complacency can come with a price as cold stress can affect anyone. However, the outdoor nature of many construction jobs leaves many laborers particularly vulnerable. Know the symptoms of cold stress ailments and be prepared to treat them. Better yet, take steps to avoid cold stress altogether.

Hypothermia

Hypothermia occurs when body heat is lost faster than it is replaced. Symptoms—shivering, loss of coordination, slurred speech and pale, cold skin—begin to appear when body temperature drops from the normal 98.6°F to 95°F. Death usually results when body temperature falls below 80°F.

Hypothermia's symptoms are gradual and since most cases occur when the temperature ranges from 30°F to 50°F, the condition can sneak up on victims unaware of the danger. Additionally, medications like anti-depressants, sedatives, tranquilizers and cardiovascular drugs can sometimes make people more susceptible to hypothermia.

In cases of mild hypothermia, the victim should be moved to a warm area, covered with dry clothes and blankets and given a warm, non-alcoholic, non-caffeinated drink.

For severe cases, 911 should be called for emergency medical help.

Frostbite

Frostbite occurs when the skin actually freezes and loses water. The affected part of the body—the face, feet and hands are particularly susceptible—will be cold with stinging, tingling, aching and numbness. Frostbitten skin may turn red, purple or white and may blister. Severe cases may require surgical removal of damaged tissue and/or amputation.

Frostbite is treated by moving the person to a warm location and wrapping, not rubbing, the frostbitten area in a soft cloth. The affected area should be immersed in warm water and a call made for medical assistance.

Trench foot

Trench foot occurs when feet are cold and wet for long periods of time. Tingling, itching, burning and blisters are all symptoms of trench foot.

Trench foot is treated by soaking feet in warm water and then wrapping them in dry cloth bandages. The person should be given a warm, non-alcoholic, non-caffeinated drink.

With appropriate dress, all of these conditions can be avoided.

What to wear:

- At least three layers of clothing: an inner layer of wool, silk or synthetic to wick moisture away from the body; a middle layer of wool or synthetic to provide insulation; and an outer wind and rain protection layer that allows ventilation to prevent overheating
- A hat—up to 50% of body heat can be lost when the head is uncovered
- Insulated footwear

Also:

- Keep a change of dry clothing available.



- With the exception of the wicking layer, do not wear tight clothing. Loose clothing allows better ventilation of heat away from the body.
- Do not underestimate the wetting effects of perspiration. Oftentimes, wicking and venting of the body's sweat and heat are more important than protection from rain or snow.

Remember:

- Days are getting shorter and darker. Wear high-visibility caps, coats and vests.
- Even in the fall or winter, always protect skin from the sun's damaging rays. Always put on sunscreen.

Weather conditions need not be extreme to be dangerous. Autumn days can be both invigorating and hazardous. Dress appropriately and stay healthy.

Cold Stress in Construction, a health alert, and [Cold Stress Education for Laborers](#), a 28-page instructor's guide, provide additional information.

Reprinted with permission. Originally published by Laborers' Health & Safety Fund of North America, www.lhsfna.org.

Autumn Driving Safety

By Carl Griffith

The start of the fall season means that sun glare (mainly on east-west routes) can make driving more hazardous during morning and evening commutes. Driving through work zones can be more hazardous when the sun glare exists at certain times of the day.

While it may seem obvious, it is a seasonal concern that needs extra attention. Heightened awareness will make the roads safer for everyone.

Additional Autumn Safety Tips

- Intense glare from the sun on the horizon has the potential to blind drivers, causing unexpected slowdowns.
- You can better prepare for this glare by keeping your windshield clean, using your visor and keeping a pair of sunglasses in the vehicle.

- Leaving more space between you and the vehicle in front of you is one key to avoiding an unwanted crash in certain fall conditions.
- Make adjustments for the light. Did you know that we lose a minute of daylight every day until the clocks are set back in November?
- Fewer hours of daylight make it more difficult to see pedestrians, cyclists and children playing in the late afternoon.
- Steer clear of wet leaves. Wet leaves are slippery and reduce traction.
- Do not veer for deer. If a crash with a deer is unavoidable, do not swerve. Be sure to brake firmly and hold onto the steering wheel with both hands.
- Watch for frost. Dipping nighttime temperatures bring frost to the windshields and roads. Be sure to clear your windshield completely before driving. Also, decelerate or gently brake when approaching bridges and overpasses.
- Stay alert for shaded areas that could create black ice during early morning and evening hours.
- Please remember to slow down and pay attention in work zones. The life you save could be your own!

Fukushima Disaster Lessons

Below are excerpts from the Fukushima Daiichi Nuclear Station Nuclear Regulatory Commission inspection. [Click here](#) to read the full report.

Application

This temporary instruction (TI) applies to all holders of operating licenses for nuclear power reactors.

Inspection results from this TI will be used to evaluate the industry's readiness for a similar event and to aid in determining whether additional regulatory actions by the U.S. Nuclear Regulatory Commission (NRC) are warranted. Therefore, the intent of this TI is to be a high-level look at the industry's preparedness for events that may exceed the design basis for a plant.

Background

On March 11, 2011, the Tohoku-Taiheiyou-Oki Earthquake occurred near the east coast of Honshu, Japan. This magnitude 9.0 earthquake and

November 2011



the subsequent tsunami caused significant damage to at least four of the six units of the Fukushima Daiichi nuclear power station as the result of a sustained loss of both the offsite and onsite power systems. Efforts to restore power to emergency equipment have been hampered or impeded by damage to the surrounding areas due to the tsunami and earthquake.

Units 1 through 3, which had been operating at the time of the earthquake, scrambled automatically, inserting their neutron-absorbing control rods to ensure immediate shutdown of the fission process.

Following the loss of electric power to normal and emergency core cooling systems and the subsequent failure of backup decay heat removal systems, water injection into the cores of all three reactors was compromised, and reactor water levels could not be maintained. Tokyo Electric Power Company (TEPCO), the operator of the plant, resorted to injecting sea water and boric acid into the reactor vessels of these three units in an effort to cool the fuel and to ensure the reactors remained shut down. However, the fuel in the reactor cores became partially uncovered.

Hydrogen gas built up in Units 1 and 3 as a result of exposed, overheated fuel reacting with water. Following gas venting from the primary containment to relieve pressure, hydrogen explosions occurred in both units and damaged the secondary containments. It appears that primary containments for Units 1 and 3 remained functional, but the primary containment for Unit 2 may have been damaged. TEPCO cut a hole in the side of the Unit 2 secondary containment to prevent hydrogen buildup following a sustained period when there was no water injection into the core.

In addition, problems were encountered with monitoring and maintaining Units 3 and 4 spent fuel pool (SFP) water levels. Efforts continue to supply seawater to the SFPs for Units 1 through 4 using various methods. At this time, the integrity of the SFPs for Units 3 and 4 is unknown.

Fukushima Daiichi Units 4 through 6 were shut down for refueling outages at the time of the earthquake. The fuel assemblies for Unit 4 had

been offloaded from the reactor core to the SFP. The SFPs for Units 5 and 6 appear to be intact. The damage to Fukushima Daiichi nuclear power station appears to have been caused by initiating events that may have exceeded the design basis for the facilities.

Guidance

The events at the Fukushima Daiichi plant appear to be caused by factors directly impacting nuclear safety that may have exceeded the design basis for the facility. While details on the full extent of damage to these units remain unknown, the damage poses a significant challenge to the nuclear safety of these units. Immediate actions by the U.S. industry are appropriate to assess and take corrective actions to address potential vulnerabilities that would challenge response to events that are beyond site design bases.

03.01 Assess the licensee's capability to mitigate conditions that result from beyond design basis events, typically bounded by security threats, committed to as part of NRC Security Order Section B.5.b issued February 25, 2002 and severe accident management guidelines and as required by Title 10 of the Code of Federal Regulations (10 CFR) 50.54(hh). Use Inspection Procedure (IP) 71111.05T, "Fire Protection (Triennial)," Section 02.03 and 03.03 as a guideline. If IP 71111.05T was recently performed at the facility, the inspector should review the inspection results and findings to identify any other potential areas of inspection. Particular emphasis should be placed on strategies related to the spent fuel pool. The inspection should include, but not be limited to, an assessment of any licensee actions to:

- a. Verify through test or inspection that equipment is available and functional. Active equipment shall be tested and passive equipment shall be walked down and inspected. It is not expected that permanently installed equipment that is tested under an existing regulatory testing program be retested.
- b. Verify through walkdowns or demonstration that procedures to implement the strategies associated with B.5.b and 10 CFR 50.54(hh) are in place and are executable. Licensees may choose not to

connect or operate permanently installed equipment during this verification.

c. Verify the training and qualifications of operators and the support staff needed to implement the procedures and work instructions are current for activities related to Security Order Section B.5.b and severe accident management guidelines as required by 10 CFR 50.54 (hh).

d. Verify that any applicable agreements and contracts are in place and are capable of meeting the conditions needed to mitigate the consequences of these events.

e. Review any open corrective action documents to identify vulnerabilities that may not have yet been addressed.

03.02 Assess the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63, "Loss of All Alternating Current Power," and station design is functional and valid. Refer to TI 2515/120, "Inspection of Implementation of Station Blackout Rule Multi-Plant Action Item A-22" as a guideline. It is not intended that TI 2515/120 be completely reinspected.

The inspection should include, but not be limited to, an assessment of any licensee actions to:

a. Verify through walkdowns and inspection that all required materials are adequate and properly staged, tested and maintained.

b. Demonstrate through walkdowns that procedures for response to an SBO are executable.

03.03 Assess the licensee's capability to mitigate internal and external flooding events required by station design. Refer to IP 71111.01, "Adverse Weather Protection," Section 02.04, "Evaluate Readiness to Cope with External Flooding" as a guideline. The inspection should include, but not be limited to, an assessment of any licensee actions to verify through walkdowns and inspections that all required materials and equipment are adequate and properly staged. These walkdowns and inspections shall include verification that accessible doors, barriers and penetration seals are functional.

03.04 Assess the thoroughness of the licensee's walkdowns and inspections of important equipment needed to mitigate fire and flood events to identify the potential that the equipment's function could be lost during seismic events possible for the site. Assess the licensee's development of any new mitigating strategies for identified vulnerabilities (e.g., entered it in to the corrective action program and any immediate actions taken). As a minimum, the licensee should have performed walkdowns and inspections of important equipment (permanent and temporary), such as storage tanks, plant water intake structures and fire and flood response equipment, and should have developed mitigating strategies to cope with the loss of that important function. Use IP 71111.21, "Component Design Basis Inspection," Appendix 3, "Component Walkdown Considerations," as a guideline to assess the thoroughness of the licensee's walkdowns and inspections.

Eye Injury Prevention: Activities to Emphasize the Importance

By Michael Carter

As you leave your workplace today, take a few moments to observe the beauty all around you. Be sure to see the blue sky, the many shades of leaves in the trees and the animals that occupy them. When you arrive home, make time to observe your children at play and pay attention to how their eyes light up when you or your spouse arrives home. Have you ever stopped to consider just how wonderful your eyesight really is?

Close your eyes completely for about one minute and consider how your life would be if you lost your eyesight. Did you come up with visions about how your life would change if you could not see?

In a previous job, I wanted to illustrate to employees, and have them strongly consider, what life would be like if their eyesight were lost. I wanted to show how even everyday simple activities that most of us take for granted could be drastically affected by loss of sight. I discussed this with my boss, and we came up with two activities that really seemed to drive the point home.



For the next week, I walked our facility with a child's shape puzzle which consisted of eight basic shapes (for ages 3 and up). I spoke with employees about eye safety and challenged them to place the shapes on the board in their correct slots while blindfolded. I had many takers, and I timed each attempt with a stopwatch. Those who participated were amazed at how an activity that would normally take a matter of seconds suddenly took a matter of minutes.

A few weeks later, I filled a large bowl primarily with assorted coins and then added a few washers, buttons and other miscellaneous coin-shaped items. I then proceeded to walk the facility and challenge employees whom I encountered to try my "change counting" activity. I again used this opportunity to talk about eye safety and then had employees, while blindfolded, attempt to count out \$0.86 cents from the bowl. I again timed each try with the stopwatch. It was amazing to see how a simple everyday task suddenly became a true test of their ability.

I certainly hope that you find the activities described above to be thought-provoking and beneficial. Keep in mind that these can be used subtly or you can, for example, turn them into a facility-wide contest with prizes to help drive employee interest.

Always remember that your eyesight is a precious gift. Please do not wait until it is too late to open your eyes and protect your vision.

5 Seconds to Safety

By Carl Griffith

Before you begin any critical task, stop for 5 seconds and ask yourself the following questions:

- Do I really need to perform this task?
- Do I know the proper way to perform this task?
- Have I identified the hazards involved in performing this task?
- Have I taken steps to control the hazards?
- Am I ready to safely perform this task?

If you must perform the task and answer yes to the last three bullet points—go for it!

Example 1

Answering cell phone while driving:

- Do I really need to perform this task? In most cases, you can probably wait until you stop or pull over to answer the cell phone.
- Do I know the proper way to perform this task? Can you wait until you pull over?
- Have I identified the hazards in performing this task? The hazards include distracted driving, which could result in a serious motor vehicle accident.
- Have I taken steps to control the hazard? If you wait to answer until pulling over, you have. If you make the decision that you must answer, have you taken time to look around to determine if it is safe to answer it while moving? In other words, do not automatically grab the phone: look around and see if it is safe before doing so.
- Am I ready to safely perform this task? Only if everything above is OK.

Example 2

Backing vehicle:

- Do I really need to perform this task? Is there another way?
- Do I know the proper way to perform this task? Am I using a spotter to help me back up?
- Have I identified all the hazards in performing this task? Did I perform a circle of safety looking for objects or people in the blind spots?
- Have I taken steps to control the hazard? If you do not have a completely clear view, get a spotter. Never perform blind backing.
- Am I ready to safely perform this task? Have I done everything correctly above? Did I do the circle for safety? Am I backing with the help of a spotter?



Example 3

Hand digging:

- Do I really need to perform this task? If you do not need to dig, then don't.
- Do I know the proper way to perform this task? Have you been properly trained in hand digging?
- Have I identified all the hazards in performing this task? Have you thought about the presence of located facilities, your understanding of such locates and if there is a possibility for unlocated underground utilities/pipes/etc.?
- Have I taken steps to control the hazard? Do you have your PPE? Will you use it when required?
- Am I ready to safely perform this task? Do you know all of the proper procedures and have the proper PPE?

These examples are to provide you with the thought process that one should go through before performing any high-risk task.

I feel that if workers took 5 seconds to answer the above questions we can make an impact on injury reduction.

Utilities Branch New Volunteer Advisory Committee Member Recognized

Connie Muncy, Safety Officer for Montgomery County Water Services and the Solid Waste District, was recently recognized by the Montgomery County Commissioners as one of ASSE's 100 Women Making a Difference in Safety. Women from around the world and throughout history are being honored for their dedication to protecting people, property, and the environment.

"Connie works diligently to ensure our employees' safety," said Commission President Debbie Lieberman. "Montgomery County is proud to have

Connie recognized and honored internationally by ASSE."

Muncy has persevered to promote government workplace safety. In 2009, her team's operations won the NIOSH Safety in Sound service sector national award for occupational hearing conservation efforts. In 2008, the team received the State of Ohio Burke Safety Award from the Ohio Water Environment Association. Muncy holds a B.S. in Chemistry from Wright State University in Dayton, OH, and a master's degree in Environmental Health and Safety Management from the University of Findlay in Findlay, OH.

In addition to her many professional accomplishments, Muncy is a past president of ASSE's Kittyhawk Chapter and is an active member of the Dayton and Miami Valley Safety Council, where she has served as Board Chair. Muncy is also a member of the Montgomery/Greene County Local Emergency Response Council where she is former chair. She is an active presenter at annual conferences for organizations, such as the National Registry of Environmental Professionals, the American Industrial Hygiene Association and the Ohio Water Environment Association.

Muncy has written and presented more than 20 papers and workshops at various symposiums and conferences. She also volunteers at the Dayton Area Chamber of Commerce with 10-hour OSHA Outreach courses and she has taught emergency preparedness courses to hundreds from area businesses.

The Future of the Utilities Branch

ASSE and the Utilities Branch would like to thank the following members who have volunteered to serve on the advisory committee for 2011-2012. We thank you all for your time and dedication to the Utilities Branch and the safety community.

Chair: [Stephen Brooks](#)

Vice Chair: [Carl Griffith](#)

Secretary: [Bill Paoello](#)

Publication Coordinator: [Michael Carter](#)

Awards & Honors: [Connie Muncy*](#)

Body of Knowledge: [Chris Jeter](#)

Conferences & Seminars: [Gary Keith](#)

November 2011



Membership Development: [David Driver](#)

Web: [Michael Caro*](#)

*Help us welcome our newest volunteers!

Awards & Honors Nominations

Utilities Branch members are highly encouraged to nominate peers for an award to recognize their exceptional work and service. Winners will be acknowledged at the annual conference, on the [ASSE website](#) and in press releases. Below are two awards for which Utilities Branch members are eligible:

- Council on Practices & Standards Safety Professional of the Year
- Utilities Branch Significant Contributor

Foundation Launches 2012 Scholarship & Grant Program

The ASSE Foundation (ASSEF) is pleased to announce the 2012 Scholarship and Professional Education Grant Program available to students pursuing degrees in occupational safety and health and to ASSE members and safety professionals working to advance their professional credentials.

Thanks to generous donors, ASSEF is offering nearly \$170,000 in 2012. This year, ASSEF is introducing six new awards. A complete list of awards, criteria, applications and program rules are available on the ASSEF website.

For scholarships, click [here](#). For professional education grants, click [here](#).

Applications are due December 1, 2011, and award recipients will be announced on or around April 1, 2012.

ASSE Kids' Poster Contest

Entries Due February 14, 2012

Today, 12 people a day die from on-the-job injuries in the U.S. Recent federal statistics show that in 2010, 4,547 workers died from on-the-job injuries and millions more suffered injuries and illnesses.

ASSE's holds an annual poster contest for children aged 5-14 to increase awareness of this issue. The winning poster from each of the five age groups will be featured on the annual North American Occupational Safety and Health (NAOSH) Week poster distributed worldwide. The five grand prize winners and 15 runners-up each receive prizes and are recognized at NAOSH kick-off events in Washington, DC, in May 2012. The posters that best illustrate safety on the job will win the contest.

To enter, a child must be sponsored by an ASSE member. Those seeking an ASSE member to request sponsorship can check with their local [ASSE chapter](#).

The rules and entry form are below:

- [Poster Contest Rules](#)
- [Poster Contest Entry Form](#)
- [Poster Contest Presentation](#)
- [2011 NAOSH Poster Contest Winners](#)
- [Template letter members can use to solicit participation in the poster contest from their local schools](#)

Poster contest winners will be announced the first week of March on ASSE's [website](#). In addition to being featured on the NAOSH poster, the posters are displayed in Washington, DC, during NAOSH Week at the Department of Labor, the U.S. Capitol and at ASSE's annual Professional Development Conference and Exposition to be held in Denver in June 2012.

ASSE State Government Affairs

ASSE Government Affairs at the practice specialty, chapter and state level is intended to be a member-led activity. The national office can provide expertise, advice and whatever assistance is needed to achieve government affairs initiatives at the different levels, but the initiative to undertake activities largely must come from members themselves.

The [operating procedures](#) of the national Government Affairs Committee (GAC) explain the organization and details the procedures for approval that need to be followed when an initiative is undertaken.



The best practice is for each practice specialty to appoint a Government Affairs Chair to monitor and send to members via LinkedIn the legislative and regulatory information that national Government Affairs provides as a free member benefit. These are the *GA Updates* and *State Legislative and Regulatory Activity Reports*. Members value the information to help them keep current with developments that could very well affect their responsibilities as SH&E professionals.

Government Affairs Chairs also should work closely with their Advisory Committee, the Council on Practices and Standards and Council on Professional Affairs staff to pursue opportunities to impact legislation and regulation or to raise the visibility of ASSE's members among state legislators and regulators.

If you would like to be the Government Affairs Chair for your branch, contact [ASSE staff](#) or your [Branch Chair](#). Click [here](#) to learn how to gain influence through the political process and how to get involved in government affairs in your industry.

ASSE members have achieved positive results, such as changing the course of a cell phone bill in North Carolina and getting safety professionals recognized in New Jersey law. Anything is possible. But the first step is simply getting involved.

