

Health and Safety Plan for The 2007 Spill of National Significance Exercise

March 1, 2007

Call 911 for all emergencies (Be aware that in certain facilities you may have to dial an access number such as 8 or 9 before dialing 911. You will receive this information in your participants briefing.)

Note to document author: If you know the final location of the ICP then local non-911 medical numbers as well as the main safety controller may be listed here as well

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Health and Safety Plan (HASP) for The 2007 Spill of National Significance Exercise (SONS 07)

PURPOSE

This document provides basic health and safety program guidance for federal, state and local agencies; and their respective employees and contractors involved in SONS 07. This HASP describes overarching requirements and best practices for employee health and safety protection. This safety plan DOES NOT supplant any organization's specific health and safety plan but is intended to clarify, advise, and tie together the numerous safety processes and potential hazards relevant to the exercise. The appendix of this document lists detailed task/operation-specific health and safety plans for potential hazardous tasks/operations that might be encountered. This list is not exhaustive. Each organization is responsible for the safety of its personnel and visitors attending the locations. Individual organizations are responsible for developing HASPs specific to their operation for the protection of their own employees.

BACKGROUND

This HASP was developed using basic risk management principles to provide for the greatest level of protection for the greatest number of employees at risk. Specific operations or locations that contain actual or potential hazards not considered in the basic plan may require greater levels of protection. It is incumbent on each organization involved with SONS 07 to have a competent person¹ provide a job hazard analysis (JHA) prior to commencing work.

OSHA's software program, e-HASP 2, was used to help develop this HASP. It adheres to the basic principles outlined in OSHA's Health and Safety Program Management Voluntary Guidelines, which follow:

- Management commitment and employee involvement
- Worksite analysis
- Hazard prevention and control
- Health and safety training

Large exercises and spill control events may have injuries for various reasons. These include crowded conditions, confusing instructions, fatigue, stress, high noise levels, inadequate work space, shortage of safety equipment, and environmental hazards related

¹ OSHA defines a "competent person" as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them." (29 CFR 1926.32(f), emphasis added)

to weather, or the incident specific hazards themselves. Safety is everyone's responsibility. As such, everyone is responsible for adhering to this and their organization's health and safety program, as well as protecting their own safety and that of others.

Everyone is a safety observer. Any observed unsafe activities or conditions, will be corrected immediately, if possible. If it is not possible to correct unsafe activities or conditions, immediately notify the nearest Exercise Controller or the Exercise Safety Coordinator so the hazard can be corrected or mitigated.

EXERCISE SAFETY COORDINATOR

The SONS 07 Safety Coordinator will be assigned to the NIC Command Post Control Room and will be available around the clock during the exercise for consultation. The Exercise Safety Coordinator is:

(NAME)

(PHONE)

(E-MAIL)

(OTHER PERTINENT CONTACT INFORMATION)

EXERCISE SCENARIOS VERSUS REAL SITUATIONS

Safety Officers

During the exercise, two types of safety personnel will be involved. Various organizations will have their Incident Safety Officers (ISO), whose primary assignment will be to ensure the on-going safety of the field operations during the exercise. Additionally, there may be Field Safety Officers (FSO) at the various equipment deployment locations. In some cases these positions may be combined. In the various Command Posts, there will also be "Exercise Safety Officers" that are part of the Exercise Command Staff and are role-playing as if handling safety issues that would have arisen from the exercise scenario. As a general rule, if manning allows Exercise Safety Officers will concentrate on safety issues relative to the scenario being presented. Actual or real safety issues will be addressed by the Exercise Controllers.

IN CASE OF A SEVERE OR LIFE-THREATENING INJURY OR ILLNESS: CALL 911

(Be aware that in certain facilities you may have to dial an access number such as 8 or 9 before being able to call 911. You will receive this information in your participant briefing).

During the exercise there may be “simulated” injuries or safety events injected to drive the scenario. Injects are to always be preceded with the statement:

“This is a drill.”

It’s important to distinguish from real and simulated events. During communications back to the Command Post, Control Room, etc., the format described below will be used for actual or real emergency events requiring emergency medical services, or actual or real events such as fires, explosions, or other imminently hazardous conditions:

Radio communications to the Command Post or Control Room will be transmitted as follows for **ACTUAL OR REAL EMERGENCY INCIDENTS ONLY**:

The person transmitting the alert will emphasize:

“This is a REAL EMERGENCY- this IS NOT A DRILL.”

Emergency Play Stop

All unsafe conditions or real-time injuries/events are to be brought immediately to an Exercise Controller at the location. The Exercise Controller will ensure that the Control Room has been advised and may immediately stop play at that location until the emergency condition is corrected. The Exercise Controller, in conjunction with the Lead Exercise Controller in the Exercise Control Room and Exercise Safety Coordinator, will decide when the situation is safe to resume play activities. In addition every effort shall be made to inform all lead controllers at all venues and Incident Commanders of a real emergency as soon as possible. Public Information Officers should also be informed of same as soon as possible.

COMMAND POST ACTIVITIES

Command Post activities can be hectic. Command Post personnel will be particularly vigilant of safety hazards. It is everyone’s responsibility to be aware of the location of emergency exits, fire extinguishers, first aid kits, Automatic External Defibrillators (AED’s), etc. These items will be covered in the player briefing; if not, ask a Safety Officer or Exercise Controller for clarification of such information.

FIELD ACTIVITIES

Persons performing field activities must be aware of potential hazards. Hazards that will be considered include slips, trips, and falls; being struck or crushed by moving

equipment; weather related injuries such as sunburn; unintentional injuries related to firearms; inhalation injuries, e.g. dust, carbon monoxide; and animal- and plant-related injuries. This list is not exhaustive; it is intended to be a starting point when considering various potential hazards.

Safety briefings, tailgate meetings, etc. must be conducted prior to commencing any field activities to ensure all potential hazards have been identified or eliminated.

ORGANIZATION RESPONSIBILITIES

Site Specific Plan

Organizations will have site specific health and safety plans that will address the following: a job hazard analysis (JHA), hazard control, appropriate exercise apparel, personal protective equipment (PPE), training, and recordkeeping. The appendices at the end of this document offer guidance for site specific health and safety plans. OSHA's e-HASP 2 software is a recommended resource to be used for the development of such plans. This software can be downloaded directly from the following website:
<http://www.osha.gov/dep/etools/ehasp/index.html>

Job Hazard Analysis (JHA)

Each organization will prepare JHAs for their operations. The JHA is typically developed and prepared by a team of personnel familiar with the specific task or operation. Generally accepted principles of risk management and hazard control will be applied. The JHA will focus on risks to employee health and safety. Each identified hazard (actual or potential) will be addressed with appropriate mitigation strategies (i.e., hazard controls). JHAs are stand-alone documents that will serve as a reference for individual employees and supervisors performing the task or operation. The hazard control measures must be specific, clear, concise, and practical. Any required permits (i.e., confined space entry, hot work, etc.) will be attached to the JHA. The organization will keep copies of all JHAs for review by occupational health and safety professionals and by government agencies having jurisdiction.

Hazard Control

Hazards will be addressed according to the hierarchy of controls, listed below in descending order of preference:

- Elimination or substitution: Not a viable option for most hazards created by natural disasters, although it may be considered for introduced hazards, such as for materials or processes brought in during exercise operations.
- Engineering controls: Physical steps to reduce or eliminate exposure to a hazard, such as installation of a guard on a machine.
- Work-practice or administrative controls: Work rules or procedures that lower the exposure to hazardous conditions.

- Personal protective equipment (PPE): Provision of protective equipment and garments is the least desirable method of protection, but in many instances it may be the only option possible.

Appropriate Exercise Apparel

Persons participating in the exercise must wear uniforms or attire appropriate to the activities they will be performing. Field deployment and underway activities must be evaluated for hazards and subsequent required personal protective equipment and apparel will be issued. Head-wear must be considered for daytime outside activities to minimize sun exposure. If there is any doubt regarding appropriate apparel, see a designated Exercise Safety Officer or contact the Exercise Safety Coordinator.

Personal Protective Equipment (PPE)

The use of PPE must be properly assessed. Equipment must be properly selected for the hazard, and properly fitted for the employee. Employees must be trained in the equipment's uses and limitations, as well as proper donning/doffing techniques and decontamination procedures for simulated and real emergencies. Equipment must be inspected before each use and repaired or replaced as needed. PPE will be maintained and stored in a clean and sanitary manner. Organizations will maintain adequate supplies for timely replacement of lost, worn, or broken PPE.

The following PPE may be needed during exercise play:

- Foot Protection: ANSI-approved protective footwear for the activity being performed
- Eye and face protection: Safety glasses, goggles, full face shields, or other suitable protection. OSHA has published additional guidance on the selection and use of face and eye protection, which is available at the following website: <http://www.osha.gov/SLTC/eyefaceprotection/index.html>.
- Head protection: Hard hat or helmet, in areas where overhead falling object or electrical hazards exist
- Appropriate work clothing: Providing protection from cuts and abrasions, irritation, and UV-light. Consideration must be given to heat stress issues (i.e., light colored, loose-fitting garments).
- Hand protection: Gloves suitable for the tasks being performed (balancing dexterity versus protection). Considerations include biological hazards (bloodborne pathogens), chemical hazards, and physical hazards (abrasion, cuts and punctures, heat).
- Hearing protection: Organizations will comply with 29 CFR 1910.95 *Occupational noise and exposure*. Earplugs, earmuffs, or a combination, will be used when employees are working around potential noise sources. Hearing protection must be worn when noise levels exceed 90 dBA.² A useful "rule of

² When operations are covered by OSHA's General Industry Standards, OSHA requires that individuals who have standard threshold shifts use hearing protection when noise levels exceed 85 dBA.

thumb:” if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA. See

<http://www.osha.gov/SLTC/noisehearingconservation/index.html> for additional OSHA-published information on noise and hearing conservation programs.

- High visibility garments: While such garments may make an employee more conspicuous to approaching drivers, they do not offer any actual protection from traffic. Such garments must be used in conjunction with other traffic safety means.
- Respiratory protection: Where nuisance levels of dust or mold are present, use of an N95 filtering face piece is recommended. Charcoal-impregnated masks may provide additional comfort against nuisance odors. When airborne contaminants exceed, or may reasonably be expected to exceed, exposure levels, the use of respiratory protection is required. Where contaminants such as lead, asbestos, or silica, are present, N100 or P100 air purifying respirators must be used. Where other contaminants exist, specific filters or cartridges appropriate to the contaminant must be used; combination cartridges and filters must be used when multiple contaminants are present. Surgical masks and dust masks that are not NIOSH approved are not considered suitable respiratory protective devices. The use of respirators requires compliances with 29 CFR 1910.134 *Respiratory protection*, which includes the development of a Respiratory Protection Program, employee training, and fit testing. Voluntary use of respirators must conform to Appendix D of 29 CFR 1910.134 *Respiratory protection*.
- Protection from drowning: Employees working on, over, or near water that present a drowning hazard will wear appropriate personal floatation device approved by the US Coast Guard. Additional protections, such as a life saving skiff and a ring buoy will be provided in accordance with 29 CFR 1926.106 *Working over or near water*.

Specific circumstances, such as structural firefighting, confined-space entry, and response to hazardous materials releases, require specific PPE ensembles and procedures that are beyond the scope of this HASP. Organizations addressing such hazards must conduct individual JHAs and assign appropriate PPE in conformance with applicable standards (i.e., OSHA, NFPA, etc.).

Training - Compliance with 29 CFR 1910.1200 (Hazardous waste training) will be checked by the Safety Officer at each site and records spot checked by controllers.

All personnel engaged in exercise operations must be trained to recognize and avoid hazards as appropriate. This training is composed of several elements:

- Site-specific training that covers the hazardous conditions and exposures that employees may encounter at a particular location. Identify specific controls such as specialized equipment, work practices, and additional PPE necessary for the particular job site. These controls may be identified in a Job Hazard Analysis (JHA) developed for the task or operation.

- Task- or operation-specific training on how to perform the job safely, including any training mandated by specific standards.
- Training that is mandated by government agencies, such as OSHA, EPA, USCG, DOT, etc., will be provided in accordance with those agencies' guidelines.
- Training must be conducted before employees are deployed.
- Daily pre-deployment and pre-job briefings will be conducted that will cover the day's work plan, anticipated hazards, and required exposure controls.

Recordkeeping

Accurate records of employee training will be maintained and available for review. Training records include training certificates, attendance rosters, and course curricula. Each organization is responsible for maintaining employee injury and illness records in accordance with 29 CFR 1904.7 *General recording criteria* and 29 CFR 1910.1020 *Access to employee exposure and medical records*.

EMPLOYEE RIGHTS AND RESPONSIBILITIES

It is the responsibility of the organization to provide a safe and healthful workplace for their employees. It is the responsibility of employees to comply with established work rules, participate in safety training, and to use assigned personal protective equipment.

Employees who identify a hazard will immediately notify their supervisor. Employees may refuse to perform tasks that create an imminent danger. Employees have a right to complain about unsafe or unhealthful working conditions to OSHA or other government agencies with jurisdiction. Employees who file complaints will not be subject to any discrimination as a result of exercising their rights.

All employees must adhere to the following work rules:

- Follow their organization's health and safety policies at all times.
- Follow supervisors' instructions.
- Follow personnel accountability instructions; check-in and check-out.
- Obtain vaccinations in conformance with the organization's medical direction.
- Promptly report all injuries, accidents, and near misses. Seek medical attention as needed.
- Report all unsafe conditions. Do not perform tasks until proper health and safety controls have been put into place. Employees may refuse to perform tasks that expose them to an imminent danger.
- Wear all personal protective equipment (PPE) needed for the task.
- Maintain constant awareness of their surroundings.

GENERAL HEALTH AND SAFETY PROVISIONS

Incident Management

Response operations will follow the principles of the incident command system (NIMS-ICS). The following criteria must be addressed:

- Unity of command
- Span of control
- Common terminology and plain language
- Personnel accountability
- Management by objective (planning cycle, incident action plans)

Establish operational zones as needed:

- Hot zone or exclusion zone
- Warm zone or contamination reduction zone
- Cold zone or support zone

Establish sufficient perimeter security and access control to keep unauthorized persons out of hazardous areas.

Medical Services and First Aid

The buddy system must always be used to maintain communication regarding the health and safety status of fellow employees. First aid services and provisions for medical care will be made available by the organization for employees in accordance with 29 CFR 1910.151 *Medical services and first aid*. Organizations will evaluate work areas and make arrangements for swift access to emergency medical care.

Each organization will develop and maintain a current list of the physical locations and contact numbers of local emergency organizations, including police, fire, and EMS. This list will also include designated representatives to be notified in case of emergency.

Quick drenching shower facilities and eye washes (providing clean water) will be provided for employees exposed to injurious or corrosive chemicals.

Where employees may need to be decontaminated following exposure to chemical or biological hazards, the organization will make arrangement for suitable facilities, including a reliable source of clean water. If employees need to be transported by emergency medical services due to life-saving medical priorities prior to being fully decontaminated, the ambulance crew and receiving hospital personnel will be informed of the patient's status and likely contaminants. If time permits, at least outer garments should be removed and gross decontamination performed. The patient may also be wrapped in a suitable barrier, if not medically contraindicated.

Electrical Safety

Assume that electrical lines are energized until proven otherwise. Ensure that employees are protected from electric shock by de-energizing and grounding circuits they might contact.

All electrical equipment, including generators, extension cords, lighting, and power tools, will meet applicable OSHA, NFPA, and NEC standards. Ground fault circuit interrupters (GFCI) will be installed on all 15A and 20A temporary wiring circuits.

Avoid carbon monoxide (CO) build-up due to electric generators:

- Never operate a generator indoors or in enclosed or partially enclosed spaces.
- Ensure the generator has 3-4 feet of clear space on all sides and above it.
- Never operate a generator in locations that could allow CO to enter and build up in occupied spaces, e.g. near doors, windows, or vents.
- Ensure the generator is in good working condition prior to use.

Fire Safety

Adequate fire extinguishers will be provided at work sites and/or on work vehicles. JHAs must take into account the potential for fire and the need for a fire prevention plan.

When hot work is performed, a fire watch will be provided. Hot work will not be performed where hazardous atmospheres exist. In addition, proper permits must be acquired before any hot work is conducted, as per local and federal regulations. During the exercise a permit will be acquired even if this would not normally be the case under actual emergency response conditions.

Safe storage areas for flammable and combustible liquids will be provided. Such areas will be clearly marked. Ignition sources will be at least 25 feet away from such areas; smoking will be prohibited in areas where there is a fire hazard, as well as where smoking may cause ingestion of contaminants. Containers will be bonded and grounded during dispensing.

Noise Mitigation

- Place generators, compressors, and other noisy equipment at a distance or behind a barrier.
- Move noisy operations to isolated areas or away from other tasks or operations.
- Locate work areas such as observation towers, office trailers, and break areas away from noisy operations.
- Keep unnecessary employees out of areas near noisy operations.
- Provide enclosed cabs on heavy equipment.
- Collect noise monitoring data to determine if employees are exposed to noise levels that exceed 90 dBA.

- Hearing protection must be worn when noise levels exceed 90 dBA.³
- Implement a hearing conservation program when noise levels exceed permissible levels in the workplace.

See <http://www.osha.gov/SLTC/noisehearingconservation/index.html> for additional OSHA-published information on noise and hearing conservation programs.

³ When tasks or operations are covered by OSHA's General Industry Standards, OSHA requires that individuals who have standard threshold shifts use hearing protection when noise levels exceed 85 dBA.

Firearm Safety

Organizations must establish a firearm safety program and employees will adhere to this program. All organizational protocols, Rules of Engagement, or Use of Force Policies of the responders' parent agency will remain in force.

- Treat every firearm as if it is loaded.
- A firearm must never be left loaded and unattended.
- Do not allow the muzzle inadvertently drop or point at others.
- Store ammunition in a metal container, such as an ammo box, in a cool, dry area with little temperature change.
- Employee must be very familiar with assigned handgun.
- Handgun must be oiled and in excellent working condition.
- Never allow a firearm to exchange hands unless the slide/action bolt is open and locked to the rear and made safe.
- Firearms will be pointed down and/or in a safe direction at all times. A safe direction is defined as down or in a direction that should an accidental discharge occur, little or no property damage or human injury would result.

Material Handling and Storage

The operation of powered industrial trucks will conform to 29 CFR 1910.178 *Powered industrial trucks*, including provisions for operator training. Material storage will conform to 29 CFR 1926.250 *General requirements for storage*.

Staging Areas

Organizations will plan for and establish staging areas consistent with their assigned work. During layout, think about how, when, and where materials will be used; proper storage can reduce the need to lift, carry, bend and reach. Materials that will be manually lifted should be stored at waist height, not on the ground. Staging areas will provide sufficient room for the parking of equipment and vehicles. Office space, sanitation facilities, medical and first aid care, storage for PPE and other safety equipment, and other relevant factors will all be taken into account. To the extent possible, the staging area must be laid out with traffic flow and pedestrian safety in mind. Staging areas must be provided with adequate lighting and security, and be graded and constructed for local weather conditions. If possible, staging areas must be located to minimize travel time to the work location.

Transportation, Driving Safety, and Parking

Transportation will be provided to many of the venues to reduce the need for additional vehicles on the road. Employees who drive in the course of their duties will possess valid licenses appropriate for the vehicles they are driving (including a commercial driver's

license, if required). Drivers will comply with all applicable traffic safety regulations. Organizations will ensure compliance with state laws governing the use of seat belts and the U.S. General Services Administration Executive Order 13043, *Increasing seat belt use in the United States*. Vehicles must be equipped with a sufficient number of seats for each passenger.

Since the exercise will be conducted around the clock, some persons will be required to travel during rush hour or late evenings. Try to leave plenty of time for arriving at the command post. Remember- this is an exercise- being in a vehicle accident while trying to hurriedly reach the Command Post or field location may impact the overall success of the exercise. Use caution. If delayed notify the Command Post or activity supervisor rather than hurrying recklessly.

Sufficient parking areas must be arranged for employees in a location convenient to where they report for work. Parking areas will be adequately lit and graded.

Illumination

Adequate lighting will be provided in aisles, stairs, ramps, runways, corridors, offices, shops, and storage areas where work is in progress will be lighted with either natural or artificial illumination. Ensure compliance with 29 CFR 1926.26 *Illumination*. The minimum illumination requirements for work areas are contained 29 CFR 1926.56 *Illumination*.

Sanitation

Organizations will provide or arrange for adequate sanitation facilities for their employees (hand washing and restrooms). The exercise of good personal hygiene can help minimize employee exposure to health hazards and contaminants.

- Employees must wash their hands before eating, drinking, or smoking, and both before and after using the toilet.
- Appropriate vector control measures must be put in place. Employees will utilize insect repellent containing DEET.
- Employees will avoid creating dust, work upwind whenever possible, and use appropriate PPE per their organization's JHAs. Replace PPE that is worn or torn.
- Employees will seek medical attention or self-treat any minor wounds.
- Employees must be current on all recommended vaccinations, per their organization's medical direction.
- Employees must only eat, drink, or smoke in areas designated for such activities.
- Organizations will provide potable water to all work locations
- Exercise good housekeeping. Minimize accumulations of trash and keep garbage in closed containers. Proper housekeeping also reduces potential slip/trip/fall hazards.
- Temporary labor camps must conform to the requirements in 29 CFR 1910.142 *Temporary labor camps*.

Slips, Trips, and Falls on Working Surfaces

Organizations must ensure that worksites are organized in such a fashion as to prevent slip /trip/fall injuries.

- Establish travel paths or walkways through work areas. Keep them clear to minimize trip hazards. Remove dropped objects from pathways immediately.
- Ensure that additional equipment brought to the location does not create or pose additional slip, trip, and fall hazards.
- Keep electric cords and cables and pneumatic lines out of travel paths and walkways. If this is not feasible, protect the cord to avoid creating trip hazards and to prevent damage to the cords, cables, and lines.
- Establish barriers and/or mark areas around known hazards such as holes and overhead hazards.
- Take extra care when stepping onto unstable or uneven surfaces, and onto surfaces where the hazard cannot be seen (e.g., underwater surfaces).
- Clean up spilled material as soon as practical to avoid creating a slip hazard.
- Provide sufficient lighting to safely illuminate work areas.

See <http://www.osha.gov/SLTC/walkingworkingsurfaces/index.html> for additional OSHA information and resources regarding walking and working surfaces, and slips, trips and falls.

Work-Rest Regimen, Fatigue

Due to the extended hours of the exercise, fatigue may become an issue, especially during operation of motor vehicles or other mechanical equipment. Fatigue increases the likelihood of inattentiveness, which may cause accidents. Everyone must use the buddy system to look out for fellow participants. If someone appears too tired to drive, offer to help make alternate arrangements. Prior to and during the exercise period, participants are highly encouraged to get extra rest, eat sensibly, and avoid excessive alcohol intake. A work-rest regimen is also an important element in the prevention of heat stress.

Heat Stress⁴

Excessive heat may present a serious hazard for employees, especially when coupled with high humidity. When the body is unable to cool itself by sweating, several heat-induced illnesses such as heat stress or heat exhaustion and the more severe heat stroke can occur, and can result in death. High temperature and humidity, direct sun or heat, limited air movement, physical exertion, poor physical condition, some medicines, and inadequate tolerance for hot environments are all factors that can lead to heat stress.

To help prevent heat stress, employees and supervisor must be familiar with the signs and symptoms of heat-related illnesses, and must be monitored for same. Direct sun or other heat sources will be blocked, if possible. Cooling fans, air conditioning, or misting will

⁴ Reference: OSHA Publication 3154, Heat Stress Quick Card.

be provided when possible. Regular rest periods must be permitted. Employees will drink about one cup of water every 15 minutes; avoid alcohol, caffeinated drinks, or heavy meals. Employees will wear lightweight, light-colored, loose-fitting clothes.

If an employee is exhibiting the signs or symptoms of heat-related illnesses, summon emergency medical services at once. While waiting for help to arrive, move the employee to a cool shaded area. Loosen or remove heavy clothing. Provide cool drinking water. Fan and mist the employee with water.

Animal Bites, Stings and Aggressive Behavior

Organizations must ensure that employees have training and access to the following preventive items.

- Use insect repellent containing DEET or Picaridin on exposed skin and wear long-sleeved pants and shirts.
- Discuss hazardous wildlife (e.g., alligators, poisonous snakes) concerns with personnel familiar with these matters (e.g., game wardens, animal control officers).
- Inspect areas for nests and stray animals.
- Remove all nearby sources of stagnant or standing water.
- Assume that all snakes are poisonous and that all animals are rabid.
- Be on guard for stray or wild animals, as they can exhibit unpredictable or aggressive behavior.
- Unless properly trained, do not attempt to take custody of animals—watch them from a safe distance while contacting animal rescue/control personnel.
- Be cautious about where you place your hands and feet. Do not put your hands in holes or under objects (e.g., lumber, scrap metal, overturned boats) without checking to see if snakes, insects, or other animals are present.
- Do not sit or lay down in areas where snakes, insects, or other animals could be present (e.g., wood piles, high vegetation).
- Wear proper foot gear, such as high-top leather boots and leather gloves when handling materials where snakes, insects, and other animals may have nested (e.g., firewood, lumber, rocks, construction debris)
- Inspect and shake out clothing and shoes before getting dressed.
- Deer ticks are carriers of Lyme disease. When working in high grass, cover exposed skin with long sleeves and pants as weather permits. Report all tick bites to medical personnel.

Contact with Poisonous Plants

Organizations must ensure that employees have training and access to the following preventive items.

- Train employees on hazardous plant recognition.
- Keep rubbing alcohol accessible, as it may remove the oily resin from plants such as poison ivy up to 30 minutes after exposure.

- When appropriate, safely clear vegetation from areas where personnel are working and living (e.g., construction trailers, base camps)
- Use gloves and wear long pants and long-sleeved shirts when possibly contacting poisonous plants.
- Use a barrier cream formulated to protect against poison ivy/oak.

Sunburn Prevention

Organizations must ensure that employees have training and access to the following preventive items.

- Wear suntan lotion with a sun protection factor (SPF) of 15 or greater. Reapply as necessary to ensure protection throughout the work shift.
- When possible, wear a wide brim hat to protect exposed skin on face, head, and neck.

When possible, set up work area in a shaded location.

When possible, schedule tasks when employees will not be exposed to direct sunlight such as during the early morning or late afternoon.

Psychological First Aid

Employees exposed to a traumatic incident may suffer from psychological stress. It is important to recognize that this reaction is normal, and such feelings should be addressed and not ignored. Employees should be encouraged to talk about their feelings, maintain normal eating and sleeping habits, try to exercise and eat well balanced meals, drink plenty of non-caffeinated non-alcoholic beverages, and take breaks when possible. Employees should communicate with friends, family, and loved ones, and also reach out to community- or faith-based organizations. Organizations should make available counseling and encourage employees to make use of it.

Additional information regarding psychological stress is available at the following websites:

- CDC Emergency Preparedness Resources
<http://www.bt.cdc.gov/mentalhealth>
- SAMHSA Disaster Readiness and Response
<http://www.mentalhealth.samhsa.gov/disasterrelief/>

Visitor Safety

SONS 07 will receive wide publicity as a major emergency response exercise. Consequently, it is likely that officials and members of the media will be visiting the exercise venues during the event. To ensure the safety of all personnel, the routes and activities of such visits should be reviewed and signed-off by the organization's safety officer. Whenever possible, visits should be hosted in controlled areas that are free of the potential hazards related to the exercise. If necessary, appropriate aspects of the organization's site health and safety plan should be followed including personal

protective equipment and training. Appendix 4 to Annex F of the National Response Team Joint Information Center Model can be used as a guideline for setting up a JIC and related Public Affairs activities. Similar material contained in Annex F of ESF-15 External Affairs Media Access Program and Operations may be used if the exercise includes DHS or FEMA national level public information activities.

ICS Form 204a

The next few pages outline an ICS Form 204a sample paragraphs for various contingencies. These are samples only and should be tailored to meet the specific needs for your site. In addition when responders may be in contact with biologics or using unfamiliar equipment (as in Katrina) it is a good example to include photos.

Aerial Lifting: - Proper PPE shall be used at all times; Hardhat, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed) Ensure outriggers and breaks are secured before boom is raised. Do not exceed boom or basket load. Assume all electrical line are energized. (See Period Site Safety Plan for amplifying information)

Confined Space Entry - Proper PPE shall be used at all times; Hardhat, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type and number or need for supplied or forced air. Review/prepare all emergency response procedures prior to entry. Ensure all proper permits are on file. (29 CFR 1910.146) Notify ICP whenever teams are making entries and when they have exited any confined space. Ensure times are logged on ICS 214 (See Period Site Safety Plan for amplifying information)

Crane Operations - Proper PPE shall be used at all times; Hardhat, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed) Ensure outriggers and breaks are secured before boom is raised. Do not exceed boom/ cable load. If mobile crane is mounted on a barge, ensure that the barges GM will not be compromised by the lift. Assume all electrical line are energized. Use ANSI proscribed hand signals (if possible include a picture) (See Period Site Safety Plan for amplifying information)

Debris Removal - Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Damp or wet debris or unknown chemical containers may be contaminated and extra care shall be used in there removal under the supervision of the Safety Officer. Stay upwind of dust generating activities. Use Buoys to mark underwater locations of submerged materials. Assume all electrical line are energized. (See Period Site Safety Plan for amplifying information)

Divng – Proper PPE shall be used at all times. All divers shall have a source of emergency air and always dive in pairs. If using supplied air ensure you are not pulling

from a contaminated area. Notify IPC when divers enter and leave the water and that times are recorded in ICS 214. Take extra care when navigating because underwater landmarks will probably have shifted. Proper decontamination shall be conducted on every diver upon exiting the water and a through decontamination will be completed at the end of each operational period. Discovery of any unknown chemicals shall be reported to the Safety Officer. (See Period Site Safety Plan for amplifying information)

Dust Control – Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). (See Period Site Safety Plan for amplifying information)

Erecting Temporary Structures - Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Only specifically trained technicians will be allowed to install electrical, water, and sanitation-related facilities. All facilities must meet local permitting guidelines. (See Period Site Safety Plan for amplifying information)

Establishing Communications Systems/Establishing Power Supply - Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility or high voltage/ non conducting Hardhat and apparel, Eye Protection, footwear, Gloves as needed, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Only specifically trained technicians will be allowed to install electrical. All facilities must meet local permitting guidelines. A fall arrest or equivalent will be used when working more then 4 ft above the ground. (See Period Site Safety Plan for amplifying information)

Heavy Equipment Use - Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Every vehicle must be inspected before each use. (Brake, emergency brake, and parking brake, headlights, taillights, brake lights, audible warning device, and intact windshield – and recorded on ICS 214) **SMOKING PROHIBITED** in all fueling areas (See Period Site Safety Plan for amplifying information)

Operating Over or Near Water - Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Proper Coast Guard approved floatation devices shall be used at all times when working on or near the Water. Ensure vessel meets all Coast Guard Regulations

regarding Manning and Stability. . Take extra care when navigating because underwater landmarks will probably have shifted. (See Period Site Safety Plan for amplifying information)

Public Safety (law enforcement and emergency medical services) – All originating organizations guidelines and requirements are still in force. (See Period Site Safety Plan for amplifying information)

Traffic and Work Zone Safety – Site Leaders will ensure that all responders are wearing Proper PPE shall be used at all times; ANSI/ISEA 107-2004 compliant high visibility Hardhat and apparel, Eye Protection, Gloves, ANSI-approved foot ware, body harness, hearing protection, (reparatory protection – include cartridge type/ number/ color as needed). Ensure work Zone well lit but avoid temporary blinding of motorist, use wands, flashlights or flaggers to signal need for motorist to slow or stop. (See Period Site Safety Plan for amplifying information) (attach diagrams)

Additional information to assist Safety officers can be found in: INCIDENT MANAGEMENT HANDBOOK, U.S. COAST GUARD COMDTPUB P3120.17A AUGUST 2006 page 6-6 and 6-7 and Coast Guard ICS Coordinators will be releasing a draft Safety Officer Job Aid in spring 2007.

| | | | | | |
|--|--|---|-------------------|--------------------------------|----------|
| 1. Incident Name | | 2. Operational Period (Date/Time) From: _____ To: _____ | | ASSIGNMENT LIST ATTACHMENT | |
| 3. Branch | | | 4. Division/Group | | |
| 5. Strike Team/Task Force/Resource Identifier | | 6. Leader | | 7. Assignment Location | |
| 8. Work Assignment Special Instructions (if any) | | | | | [OPS] |
| 9. Special Equipment/Supplies Needed for Assignment (if any) | | | | | [OPS] |
| 10. Special Environmental Considerations (if any) | | | | | [P.S.C.] |
| 11. Special Site-Specific Safety Considerations (if any) | | | | | [S.O.] |
| Approved Site Safety Plan Located at: | | | | | |
| 12. Other Attachments (as needed) | | | | | |
| <input type="checkbox"/> Map | | <input type="checkbox"/> Shoreline Cleanup Assessment Team Report | | <input type="checkbox"/> _____ | |
| <input type="checkbox"/> Weather Forecast | | <input type="checkbox"/> Tides | | <input type="checkbox"/> _____ | |
| 13. Prepared by: (Resources Unit Leader) | | | | | |

APPENDICES:

Specific Health and Safety Protections

The following appendices outline basic health and safety hazards and suggested protective measures specific to a range of identified tasks and operations applicable to the most common exercise tasks. These are intended to form the baseline for health and safety protection and will be consulted when conducting a JHA. These tasks are not intended to be all-inclusive. They serve as a reference for organizations conducting their own JHAs. Non-routine tasks require specific JHAs. Referenced and other applicable standards must be consulted for all relevant details. In case of doubt, consult with a qualified health and safety professionals.

Each task-specific health and safety plan is addressed as follows:

- Identified tasks/operations
- Synopsis of primary health and safety hazards
- Engineering controls, work practice or administrative controls, personal protective equipment
- Additional training needs
- Related Appendices
- Resources and References

➤ **APPENDIX A- Aerial lifting**

- ❖ This appendix is for aerial lift operators and supervisors. It is intended to be used in conjunction with the general guidance and requirements described in the first 15 pages of this HASP. Additionally, operators of aerial lifts should refer to the other appendices that may apply (e.g., Establishing power supply, Traffic and work zone safety, etc.); see related appendices below.
- ❖ While operators should first and foremost be familiar with the proper operation of this equipment, this appendix is provided to advise them of controls for hazards likely to be encountered.

About the Appendix: This document is intended as a quick reference for organizations and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Organizations must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, organizations must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|---|
| | | mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>Use of aerial lifts</i> | <ul style="list-style-type: none"> • Do not exceed the boom and basket load limits specified by the manufacturer • Ensure that brakes are set and outriggers are used and secured before boom is raised • Never move the vehicle until the ladder is safely stored and secured (for ladder and tower trucks only) and all people are out of the basket (unless the equipment has been specifically designed for this purpose) • Never override hydraulic, mechanical, or electrical safety devices • Never allow an aerial lift to be used as a crane or material-lifting device • Do not make any modifications to the aerial lift without a written certification from the manufacturer. | |
| <i>Falls from heights</i> | <ul style="list-style-type: none"> • Ensure that users stand firmly on the floor and do not sit or climb on the edge or rails of the basket • Ensure that no devices are used to elevate employees above the basket | <ul style="list-style-type: none"> • When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |
| <i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise come in contact with them • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables • Unless de-energized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers • Do not approach a previously undetected gas | <ul style="list-style-type: none"> • |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | <p>leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured</p> <ul style="list-style-type: none"> • Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work | |
| <i>Work zone safety and traffic control within a work area</i> | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>General heavy equipment operation</i> | <ul style="list-style-type: none"> • See Appendices C- Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document

Related Appendices

- ❖ C- Crane operations
- ❖ F- Dust control
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1926 Subpart O - Motor Vehicles, Mechanized Equipment, and Marine Operations
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926.453 - Aerial Lifts
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10754
- ❖ OSHA Fact Sheet - Using Aerial Lifts http://www.osha.gov/OshDoc/data_Hurricane_Facts/aerial_lifts.pdf
- ❖ OSHA Quick Card - Aerial Lift Safety Tips
http://www.osha.gov/OshDoc/data_Hurricane_Facts/aerial_lifts_safety.pdf

➤ APPENDIX B- Confined space entry

- ❖ This appendix is for employees who enter confined and enclosed spaces. It also applies to the attendants who assist these employees and to the entry supervisor.
- ❖ Confined spaces have limited means of entry or exit, are large enough to bodily enter, and may contain physical or atmospheric hazards. Examples include storage tanks, process vessels, bins, boilers, vaults, ventilation or exhaust ducts, sewers, tunnels, pipelines, and pits more than 4 feet in depth. Examples of hazards in confined spaces include: a space might have a potential to contain a hazardous atmosphere due to the presence of decomposing organic matter, to the use of hazardous chemicals in the space, or to the performance of operations in the space, such as welding, cutting, or burning, that may create a hazardous atmosphere. Additional precautions must be taken to make the space safe for entry.

About the Appendix: This document is intended as a quick reference for organizations and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07 .It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Organizations must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, organizations must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | | <p>filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors</p> |
| <p><i>Permit-required confined space entry</i></p> | <ul style="list-style-type: none"> • Although the terms “confined space,” and particular, “permit-required confined space” have regulatory implications pursuant to OSHA’s general industry standard, 29 C.F.R. 1910.146, these terms along with the term “enclosed space,” which has regulatory implications in OSHA’s construction standard, are used in this Matrix to identify a process of evaluating these spaces for physical hazards (e.g., mechanical, electrical, hydraulic, pneumatic energy; engulfment hazards; inwardly converging surfaces) and atmospheric hazards (e.g., atmospheres that are oxygen-deficient or oxygen-enriched, contain or may contain flammable gas, vapor or mist, airborne combustible dust, toxic substances, or any other atmosphere that is immediately dangerous to life or health). • Evaluate each space to determine if it is a confined or enclosed space subject to physical or atmospheric hazards such as those described above • Once identified, mark these spaces and prevent unauthorized entry • Evaluate the purpose for entry; limit the initial entry to assessment activities only • Develop and implement an entry program that includes a means of evaluating the hazards of each space; specifying acceptable entry conditions; a system permitting entries; training for entrants, attendants, and supervisors; air monitoring; and provisions for rescue/emergency services • Eliminate, control, or otherwise protect employees from all hazards identified in the space before entry and document this | <ul style="list-style-type: none"> • Harness and retrieval system • Based on planned activities and anticipated hazards, select protective clothing, respiratory protection, gloves, and other PPE |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | <p>procedure</p> <ul style="list-style-type: none"> • Ensure that the entrant and attendant are able to communicate throughout the entry • Exit the space immediately if unsafe conditions develop (failure of ventilation system, meter alarms, experience unexplained symptoms) • Emergency rescue must be attempted only by employees who are trained in safe entry and rescue procedures and who have the proper tools and personal protective equipment, such as self-contained breathing apparatuses for entry into atmospheres that are immediately dangerous to life and health. If an off-site party (e.g., local fire department) will provide rescue services, coordinate with them to ensure that they can provide this service for each space and can get to each space timely | |
| <p><i>Atmospheric Hazards</i></p> | <ul style="list-style-type: none"> • Assess the contents and condition of tanks and equipment in the space; evaluate those that might contain hazardous chemicals, gases, flammable materials, and, if the contents were released, pose of risk of creating hazardous/oxygen deficient conditions • Establish acceptable entry conditions and document these on the entry permit • Consider the operations that will be conducted in the space and the materials that will be used in the space. If these operations or materials may create a hazardous atmosphere in the space, ensure that the ventilation, PPE, and other controls identified on the permit will protect employees from these hazards also. • Conduct initial air monitoring to determine suitability for entry and for continued work. Use air monitoring equipment (e.g., for oxygen, flammable gas, hydrogen sulfide, and carbon monoxide) to monitor for each of the hazardous conditions that might be present • Ventilate the space while entry is conducted • Conduct periodic air monitoring to ensure | <ul style="list-style-type: none"> • Based on planned activities and anticipated atmospheric hazards, select protective clothing, respiratory protection, gloves, and other PPE |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|-------------------------|---|---|
| | <p>that acceptable atmospheric conditions are maintained</p> <ul style="list-style-type: none"> • Unless known not to contain asbestos, treat all insulating materials as asbestos-containing and limit contact or disturbance of them. If material will be disturbed or needs to be removed to complete work, test material for asbestos content and implement an abatement program if necessary. | |
| <i>Physical hazards</i> | <ul style="list-style-type: none"> • Evaluate potential physical hazards (e.g., rotating machinery, exposed electrical hazards) to determine suitability for entry • Limit access until stability and structural integrity of the structure is known. Ensure that a competent person inspects the space and surrounding work area before employees enter to perform work. A competent person must be able to recognize existing and predictable hazardous conditions and must have the authority to take prompt corrective measures to eliminate the hazardous conditions. • Remove or secure objects (glass, structural members) that may fall while employees work under them • Take precautions to eliminate or reduce the threat of physical hazards. Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work. Other precautions may include: <ul style="list-style-type: none"> — removing residual material (water, residue) from outside the space — guarding dangerous equipment — de-energizing and securing (lockout/tagout) all hazardous energy sources; verify that source is secured — bleeding and then blocking pipes leading into and out of the space • Use testing equipment (e.g., voltmeters) to assess employees potential exposure to physical hazards | <ul style="list-style-type: none"> • Harness-and-retrieval system • Based on planned activities and anticipated physical hazards, select protective clothing, gloves, and other PPE |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|---|
| | <ul style="list-style-type: none"> • If utilities cannot be secured, treat them as live/charged/energized | |
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> • Limit people at space entrance to attendant and supervisor • Provide lighting in the space • Take extra care when stepping into areas that are unstable/uneven or where the surface cannot be seen • Ensure that the space is closed and labeled upon completion of the entry • See “General Health and Safety Provisions” of this document | |
| <i>Chemical and material storage and use</i> | <ul style="list-style-type: none"> • Segregate and store incompatible chemicals separately. For example, store solvents and oxidizers (e.g., peroxides) separately, and acids and caustics separately • Secure compressed gas cylinders and ensure that they are stored properly when not in use (regulators off and valve caps on when not in use; separate oxygen and fuel gas by 20 feet or using a non-combustible barrier (5 ft high, fire-resistant rating of at least ½ hour)) • Store chemicals in containers approved and designed for chemical storage and mark all storage locations • Store and handle hazardous materials in areas with natural or forced ventilation; do not store or handle in low-lying areas • Isolate, secure and identify storage areas • Prohibit smoking near storage areas | <ul style="list-style-type: none"> • Gloves made of material that will protect user from chemicals handled • Face shield or goggles with indirect venting. If a face shield is selected, eye protection must be worn under the face shield • Coveralls or apron resistant to chemicals being handled • Disposable boot covers resistant to the chemicals being handled • A respirator and cartridges specific for chemical, as necessary |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | <ul style="list-style-type: none"> • Keep ignition sources at least 25 feet away from storage areas • Ensure that fire extinguishers and extinguishing agents are available in the immediate area • Bond and ground containers before dispensing flammable liquids. Reference 29 CFR 1926.152(e)(2) | |
| <i>Exposure to contaminated water and/or floodwaters</i> | <ul style="list-style-type: none"> • Reduce the exposure to splash or aerosolized liquid hazards by limiting the number of people in the area and having those in the area stay upwind of water discharge areas • Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes • Ensure that cuts and bruises are protected from contact with contaminated water • Clean areas of the body that come in contact with contaminated water with soap and water, hand sanitizer, or sanitizing wipes | <ul style="list-style-type: none"> • Goggles if routinely working near splashing floodwater • N, R, or P95 respirators may be necessary for exposure to contaminated water that may become aerosolized • Watertight boots with steel toe and insoles • Waterproof gloves for contact with contaminated water |
| <i>Improper ladder use</i> | <ul style="list-style-type: none"> • Inspect ladders for cracked, broken, or defective parts before use • Do not exceed the load rating of ladders—remember that load ratings include people, tools, and equipment • Set up ladders on stable surfaces • Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height • Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines • Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away | |
| <i>Noise</i> | <ul style="list-style-type: none"> • Place generators and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| | | <p>A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA</p> |
| <p><i>Discovery of unknown chemicals</i></p> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> — Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area — Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <p><i>Environmental hazards (e.g., heat stress, sunburn, poisonous plants, animal/insect bites)</i></p> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |
| <p><i>Generator use</i></p> | <ul style="list-style-type: none"> • Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure’s electrical system is not isolated, it may energize the utility’s wiring system for great distances and create a risk of electrocution for utility employees and others in the area • Always plug electrical equipment directly into the generator using the manufacturer’s supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. • Do not overload a generator; it can overheat and create a fire hazard • Ground and bond generators according to the manufacturer’s recommendations; ensure that | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------|--|-------------------------------|
| | <p>any manufacturer-required connections are secure before using the generator</p> <ul style="list-style-type: none"> • Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy • Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling • Before refueling, shut down the generator and allow it to cool | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ Training for site entrant, attendant, and supervisor on hazards of confined space entry as outlined in 29 CFR 1910.146.

Other Resources and References

- ❖ 29CFR 1910.146 - Permit-Required Confined Space Standard
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9797
- ❖ OSHA Quick Card - Atmospheric Testing in Confined Spaces
http://www.osha.gov/OshDoc/data_Hurricane_Facts/atmospheric_test_confined.pdf
- ❖ NIOSH Interim Guidance: Working Safely in Confined Spaces
<http://www.cdc.gov/niosh/topics/flood/confined.html>
- ❖ OSHA Safety and Health Topics - Confined Spaces <http://www.osha.gov/SLTC/confinedspaces/index.html>
- ❖ OSHA Quick Card - Hydrogen Sulfide
http://www.osha.gov/OshDoc/data_Hurricane_Facts/hydrogen_sulfide.pdf

- ❖ OSHA Safety and Health Topics – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>
- ❖ OSHA Fact Sheet – Using Portable Generators Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf
- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf

➤ APPENDIX C- Crane operations

- ❖ This appendix is intended for crane operators and their supervisors. It advises operators and associated employees on steps they can take to protect themselves (and others) from hazards likely to be encountered during crane operation. This sheet should be used in conjunction with the appendix for the particular activity in which the heavy equipment is being used (e.g., Debris removal).
- ❖ Crane operators must be familiar with the equipment they are operating. Additionally, operators of cranes should refer to Appendix J- Heavy equipment use and the Appendix M- Traffic and work zone safety for additional general recommendations.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|-------------------------------|
| <p><i>General crane operations</i></p> | <ul style="list-style-type: none"> • Ensure that a competent person inspects all machinery and equipment before and during each use, to confirm that it is in a safe operating condition. A competent person must be able to recognize existing and predictable hazardous conditions and must have the authority to take prompt corrective measures to eliminate the hazardous conditions • If observed during an inspection, ensure that deficiencies are repaired and defective parts are replaced before machinery and equipment is used • Post any recommended operating speed, rated load capacities, or other instructions near the operator • Position cranes on firm and level surfaces; use outriggers as needed • Consult the crane load chart and do not exceed the rated capacity of the crane and rigging for the planned lift • Use the hand signals prescribed by ANSI for the type of crane being used; post an illustration of the signals at the job site • Ensure that the pathway is clear before executing a lift • Maintain at minimum a 10-foot working clearance from power lines rated at 50 kV or less; increase this clearance by 0.4 inches for each 1 kV above 50 kV; where it is difficult for the operator to maintain the desired clearance by visual means, designate a person to observe clearance of the equipment and give timely warning for all operations • Ensure that reciprocating, rotating, or other moving parts or equipment are guarded if capable of being contacted by employees • Do not make any additions or modifications to the crane without written approval from the manufacturer • When a mobile crane is mounted on a barge, ensure that the rated load of the crane is not exceeded, a loading chart is provided, and that the crane is positively secured • Ensure that floating cranes and derricks used for wet debris removal meet the applicable design, construction, installation, testing, maintenance, and operation requirements set by the manufacturer | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------------------------------------|--|---|
| <i>Cable wear</i> | <ul style="list-style-type: none"> • Ensure that the cables of the crane were inspected within the past year by a competent person • Take wire rope out of service when any of the following conditions exist: <ul style="list-style-type: none"> — In running ropes, six randomly distributed broken wires in one lay or three broken wires in one strand in one lay — Wear of one-third the original diameter of outside individual wires — Kinking, crushing, bird caging, or any other damage resulting in distortion of the rope structure — Evidence of any heat damage from any cause — In standing ropes, more than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection | |
| <i>Rigging equipment</i> | <ul style="list-style-type: none"> • Inspect rigging equipment for material handling prior to use on each shift and as necessary during its use to confirm that it is safe; ensure defective rigging equipment is removed from service. • Ensure that rigging equipment is not loaded in excess of its recommended safe working load • Ensure that rigging equipment, when not in use, is removed from the immediate work area so as not to present a hazard to employees • Ensure that lifting accessories are marked to indicate the safe working loads and are proof-tested prior to use to 125 percent of their rated load • Ensure that rigging equipment is not shortened with knots or bolts or other makeshift devices • Pad or protect rigging equipment from the sharp edges of their loads • Ensure that rigging equipment is not shock loaded | |
| <i>Lifting employees using cranes</i> | <ul style="list-style-type: none"> • Do not use cranes to hoist employees on a personnel platform, except when the erection, use, and dismantling of conventional means of reaching the worksite (e.g., personnel hoist, ladder, stairway, aerial lift, elevating | <ul style="list-style-type: none"> • Personal fall arrest system |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--------------------------------|--|--|
| | <p>work platform, or scaffold) would be more hazardous or is not possible because of structural design or worksite conditions</p> <ul style="list-style-type: none"> • Ensure that any hoisting of a personnel platform is performed in a slow, controlled, cautious manner • Hold a meeting with the crane operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the person responsible for the task and make sure that all the personnel-lifting requirements have been met prior to the trial lift at each new work location. Have a similar meeting for any employees newly-assigned to the operation • Before personnel are lifted, conduct a trial lift with an unoccupied, equivalently loaded platform • Ensure that the total weight of a loaded personnel platform and the related rigging do not exceed 50 percent of the rated capacity for the radius and configuration of the crane • Ensure the platform is not loaded in excess of its rated load capacity • Ensure that employees keep all parts of the body inside the platform during raising, lowering, and positioning • Ensure that all eyes in wire rope slings are fabricated with thimbles • When a wire rope bridle is used to connect the personnel platform to the load line, ensure that each bridle leg is connected to a master link or shackle in such a manner as to ensure that the load is evenly divided among the bridle legs • Ensure that employees are not hoisted unless the hoist ropes are free of kinks, multiple part lines are not twisted around each other, the primary attachment is centered over the platform, and the hoisting system has been inspected to ensure that all ropes are properly stated on drums and in sheaves | |
| Work zone safety | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| General heavy equipment | <ul style="list-style-type: none"> • See Appendix J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| <i>operation</i> | | when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document • | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ OSHA equipment-specific training requirements.

Related Appendices

- ❖ Appendix A- Aerial lifting
- ❖ Appendix D- Debris removal
- ❖ Appendix F- Dust control
- ❖ Appendix J- Heavy equipment use
- ❖ Appendix L- Public safety (law enforcement and emergency medical services)
- ❖ Appendix M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1926.550 - Cranes and Derricks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ 29 CFR 1926.251 - Rigging Equipment for Material Handling
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10686
- ❖ OSHA Quick Card - Crane Safety http://www.osha.gov/OshDoc/data_Hurricane_Facts/crane_safety.pdf

➤ APPENDIX D- Debris removal

- ❖ The hazards outlined in this appendix apply to debris collection and removal crews operating lifting, separating, sweeping, and hauling equipment
- ❖ For some operations or situations (e.g., Heavy equipment use, Traffic and work zone safety) other appendices also apply; see related appendices below.
- ❖ Debris collection and removal tasks include picking up, clearing, separating, and removing debris. Most of these tasks are typically performed using heavy equipment; however, some manual effort can be necessary at every stage.
- ❖ Special care is required when collecting and removing materials that are still damp, since wet materials will be heavier than they would have been if dry. Additionally, wet materials might be contaminated with any substances that contaminated floodwaters.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| | | <p>used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors</p> |
| <i>Work zone safety</i> | <ul style="list-style-type: none"> • Limit clean up operations to one side of the road at a time • See Appendix M-Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>General heavy equipment operation</i> | <ul style="list-style-type: none"> • Where possible, do not allow collection work to be done with heavy equipment under overhead lines • Inspect debris piles before using equipment to pick them up and ensure that there are no obstructions (e.g., fire hydrants, water meters, etc) underneath that may pose a hazard • See Appendices: A- Aerial lifting; C-Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |
| <i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise come in contact with them • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables • Unless de-energized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers • Do not approach a previously undetected gas leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured • Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or | <ul style="list-style-type: none"> • |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | <p>may be impacted; ensure that lines have been purged as needed before beginning work</p> | |
| <i>Overloading and tarping of vehicles</i> | <ul style="list-style-type: none"> • Do not overload vehicle • Ensure loads are balanced and are fully contained within the vehicle. Trim loads, where necessary, to ensure loads do not extend beyond the sides or top of the vehicle • Cover and secure the load before moving vehicle | <ul style="list-style-type: none"> • |
| <i>Manual handling of materials/ weight</i> | <ul style="list-style-type: none"> • Take frequent rest breaks when lifting heavy or water-laden objects • See the “General Health and Safety Provisions” section of this document. | <ul style="list-style-type: none"> • |
| <i>Work from barges and vessel, and diving operations</i> | <ul style="list-style-type: none"> • See Appendices: E- Diving ; and K- Operating over water • Do not allow employees to pass fore, aft, over, between, and around barge decks unless there is a walkway or another means for safe passage • Provide fall protection if employees on a barge must stand at an outboard or inboard edge without sufficient bulwark, rail, coaming, or other protection | <ul style="list-style-type: none"> • Personal floatation device – See Appendix K- Operating over water |
| <i>Work on, over, or near water</i> | <ul style="list-style-type: none"> • Use grappling poles to retrieve floating objects • Use buoys to mark underwater locations of submerged materials • Use additional protections, such as a life-saving skiff and a ring buoy, as appropriate | <ul style="list-style-type: none"> • Coast Guard-approved Type I or II personal floatation devices • Watertight boots with steel toe and insole |
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection— See the Noise hazard section of this Appendix and “General Health and Safety Provisions” section of this document. • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| <i>Segregation of wastes and discovery of unknown chemicals in debris</i> | <ul style="list-style-type: none"> • If intact hazardous chemical containers are found with debris, segregate them from the waste stream before continuing work in the area • If broken or leaking hazardous chemical containers are found with debris, contact a supervisor/hazardous material personnel for evaluation/removal before continuing work in the area • Store/stack containers securely so that they will not break or fall and so that they are clear of vehicular traffic and heavy equipment | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> • Maintain barge decks and other work surfaces in a safe condition • See the “General Health and Safety Provisions” section of this document. | <ul style="list-style-type: none"> • |
| <i>Cuts and lacerations</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document. | <ul style="list-style-type: none"> • |
| <i>Noise</i> | <ul style="list-style-type: none"> • Place generators, compressors, shaker-separators, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Silica, mold, nuisance dust, dried mud, and silt</i> | <ul style="list-style-type: none"> • See Appendix F- Dust control • Stay upwind of or away from dust-generating activities, and in particular those involving crystalline silica-containing materials like concrete, brick, tile, drywall, mortar, sand, or stone. When inhaled, the fine crystalline silica particles contained in the dust can become lodged deep in the lung, which can lead to silicosis and other respiratory illnesses • Use water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment, and demolishing structures | <ul style="list-style-type: none"> • At a minimum, use respirators with N, R, or P95 filters for work with crystalline silica-containing materials (e.g., concrete, brick, tile, mortar). The use of N, R, or P100 filters may provide additional protection. Higher levels of respiratory protection may be needed for some operations (e.g., cutting concrete, sandblasting, mixing concrete) • N, R, or P95 respirators may be used for nuisance dusts (e.g., dried mud, dirt, or silt) and mold (except mold remediation). Filters with a charcoal layer may be used for od |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|---|
| | <ul style="list-style-type: none"> • Avoid using compressed air for cleaning surfaces • Sample employee exposures to silica during dust-generating activities • Limit contact or disturbance of surfaces containing substantial visible mold growth | |
| <i>Confined spaces</i> | <ul style="list-style-type: none"> • See Appendix B- Confined space entry | <ul style="list-style-type: none"> • |
| <i>Chemical and material storage and use</i> | <ul style="list-style-type: none"> • Segregate and store incompatible chemicals separately. For example, store solvents and oxidizers (e.g., peroxides) separately, and acids and caustics separately • Secure compressed gas cylinders and ensure that they are stored properly when not in use (regulators off and valve caps on when not in use; separate oxygen and fuel gas by 20 feet or using a non-combustible barrier (5 ft high, fire-resistant rating of at least ½ hour)) • Store chemicals in containers approved and designed for chemical storage and mark all storage locations • Store and handle hazardous materials in areas with natural or forced ventilation; do not store or handle in low-lying areas • Isolate, secure and identify storage areas • Prohibit smoking near storage areas • Keep ignition sources at least 25 feet away from storage areas • Ensure that fire extinguishers and extinguishing agents are available in the immediate area • Bond and ground containers before dispensing flammable liquids. Reference 29 CFR 1926.152(e)(2) | <ul style="list-style-type: none"> • Gloves made of material that will protect user from chemicals handled • Face shield or goggles with indirect venting. If a face shield is selected, eye protection must be worn under the face shield • Coveralls or apron resistant to chemicals being handled • Disposable boot covers resistant to the chemicals being handled • A respirator and cartridges specific for chemical, as necessary |
| <i>Exposure to contaminated water and/or floodwaters</i> | <ul style="list-style-type: none"> • Reduce the exposure to splash or aerosolized liquid hazards by limiting the number of people in the area and having those in the area stay upwind of water discharge areas • Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes • Ensure that cuts and bruises are protected | <ul style="list-style-type: none"> • Goggles if routinely working near splashing floodwater • N, R, or P95 respirators may be necessary for exposure to contaminated water that may become aerosolized • Watertight boots with steel toe and insoles • Waterproof gloves for contact with contaminated water |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| | <ul style="list-style-type: none"> from contact with contaminated water • Clean areas of the body that come in contact with contaminated water with soap and water, hand sanitizer, or sanitizing wipes • If divers are involved, ensure divers and their equipment are appropriately decontaminated (fresh water shower/rinse at minimum) upon completion of dive operations– See Appendices: E- Diving ; and K- Operating over water | <ul style="list-style-type: none"> • |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> – Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area – Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area – Use a float/buoy to mark the location of the chemical container | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document. | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document

Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry
- ❖ E- Diving
- ❖ F- Dust control
- ❖ J- Heavy equipment use
- ❖ K- Operating over water
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1926.106 - Working over, or near water
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10669&p_table=STANDARDS
- ❖ 29 CFR 1926.251 - Rigging Equipment for Material Handling
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10686
- ❖ 29 CFR 1926.550 – Cranes
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ 29 CFR 1910.178 - Powered Industrial Trucks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9828
- ❖ 29 CFR 1910.134 - Respiratory Protection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=STANDARDS
- ❖ 29 CFR 1910.1001 – Asbestos in General Industry
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9995
- ❖ 29 CFR 1926.1101 – Asbestos in Construction
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=STANDARDS
- ❖ OSHA Fact Sheet - Cleanup Hazards http://www.osha.gov/OshDoc/data_Hurricane_Facts/Bulletin1.pdf
- ❖ NIOSH Interim Guidance on Health and Safety Issues Among Clean-Up Employees Involved with Handling and Burning Hurricane Debris <http://www.cdc.gov/niosh/topics/flood/burningdebris.html>
- ❖ OSHA Safety and Health Topic – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>
- ❖ OSHA Quick Card - Crane Safety http://www.osha.gov/OshDoc/data_Hurricane_Facts/crane_safety.pdf
- ❖ OSHA Fact Sheet - Working Safely with Chain Saws
http://www.osha.gov/OshDoc/data_Hurricane_Facts/chainsaws.pdf
- ❖ OSHA Fact Sheet - Working Safely Around Downed Electrical Wires
http://www.osha.gov/OshDoc/data_General_Facts/downed_electrical_wires.pdf
- ❖ OSHA Fact Sheet - Hand Hygiene and Protective Gloves [in Hurricane-Affected Areas
http://www.osha.gov/OshDoc/data_Hurricane_Facts/hand_hygiene_and_gloves.pdf](http://www.osha.gov/OshDoc/data_Hurricane_Facts/hand_hygiene_and_gloves.pdf)
- ❖ Manual on Uniform Traffic Control Devices http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

➤ APPENDIX E- Diving

- ❖ This appendix is for commercial divers and those who support and supervise them.
- ❖ For some operations or situations (e.g., operating over water) other appendices also apply; see related appendices below.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| <i>Generally recommended for all hazards</i> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>Diving</i> | <ul style="list-style-type: none"> • Ensure that each diver has the necessary | <ul style="list-style-type: none"> • Dive suit selected for the operation |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|---|
| <p><i>operations (SCUBA, surface supplied diving)</i></p> | <p>experience and/or training to perform the assigned task</p> <ul style="list-style-type: none"> • Provide divers and tenders with a briefing on the tasks, safety procedures, unusual hazards or environmental conditions, and modifications made to standard operating procedures. If divers will enter potentially contaminated waters, SOPs should address the potential chemical contaminants • Tend divers continuously while they are in the water • When divers are in the water, ensure that a standby diver is available when required • Establish and maintain two-way voice communications between diver and diver support throughout the dive • Primary breathing gas supplies will support divers for the duration of the planned dive including decompression • Divers will carry a reserve breathing gas supply while SCUBA diving • Supplied respirable air must contain <i>less</i> than: <ul style="list-style-type: none"> — 20 ppm Carbon Monoxide — 1000 ppm Carbon Dioxide — 5mg/m³ oil mist — and must not have a noxious or pronounced odor • Station a diver at the underwater point of entry when diving is conducted in enclosed or physically confining spaces • Terminate the dive when the diver requests it, if the diver fails to respond correctly, or when the diver begins to use reserve breathing gas • Use certified air tanks, sources of dive-breathing air, and approved body suits • Ensure that any airline systems used provide uncontaminated air (e.g., keep the systems away from sources of generator or engine exhaust) • Ensure that dive boats and on-shore locations display the diver-down flag whenever divers are in the water • Ensure that all divers and their equipment are decontaminated (fresh water | <ul style="list-style-type: none"> • Emergency source of breathing air |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|---|
| | <p>shower/rinse at minimum) upon completion of dive operations</p> | |
| <i>Vessel and barge operations</i> | <ul style="list-style-type: none"> • Comply with Coast Guard manning and safety equipment regulations (e.g., licensed/qualified staff based on size and service of the vessel, personal floatation devices, lifeboats, flares, charts for area of operation) applicable to the commercial operation of the vessel, including those related to vessel inspections • Ensure that vessels used to pull or push other platforms (e.g., barges) are of suitable design and horsepower • Take extra care when navigating because landmarks, navigational aids, and underwater hazards may have shifted. Also look for overhead hazards from tree limbs, hanging power lines, and other debris that may fall and/or strike employees • Use buoys or transponders to mark locations of submerged materials • Do not allow employees to pass fore, aft, over, and around barge decks unless there is a walkway or another means for safe passage • Provide fall protection if employees on a barge must stand at an outboard or inboard edge without sufficient bulwark, rail, coaming or other protection • See Appendix K- Operating over water | <ul style="list-style-type: none"> • Coast Guard-approved Type I or II personal floatation devices |
| <i>Liveboating</i> | <ul style="list-style-type: none"> • Stop the propeller before the diver enters or exits the water • Use a device to minimize the diver's hose from becoming entangled in the propeller | |
| <i>Support Team working on, over, or near water</i> | <ul style="list-style-type: none"> • Use additional protections, such as a lifesaving skiff and a ring buoy, as appropriate • Do not allow employees to pass fore, aft, over, between, and around barge decks unless there is a walkway or another means for safe passage • Provide fall protection if employees on a barge must stand at an outboard or inboard edge without sufficient bulwark, rail, coaming or other protection | <ul style="list-style-type: none"> • Coast Guard-approved Type I or II personal floatation devices |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <i>Exposure to contaminated water and/or floodwaters</i> | <ul style="list-style-type: none"> • When a contaminated-water splash hazard is present (e.g., when divers are entering the water, when recovering submerged objects or debris), keep non-essential employees away from the splash-hazard zone • Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes • Ensure that cuts and bruises are protected from contact with contaminated water • Clean areas of the body that come in contact with contaminated water with soap and water, hand sanitizer, or sanitizing wipes • Ensure that divers and their equipment are decontaminated (fresh water shower/rinse at minimum) upon completion of dive operations | <ul style="list-style-type: none"> • Goggles if routinely working near splashing floodwater • N, R, or P95 respirators may be necessary for exposure to contaminated water that may become aerosolized • Watertight boots with steel toe and insoles • Waterproof gloves for contact with contaminated water |
| <i>Underwater power tool use</i> | <ul style="list-style-type: none"> • Inspect power tool condition and verify operation of safety features before use • Lower power tools to the diver upon request • Ensure that power tools are deenergized before they are placed in or retrieved from the water | |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> — Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area — Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area • Use a float/buoy or transponder to mark the location of the chemical container | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|---|
| | <p>come in contact with them</p> <ul style="list-style-type: none"> • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables • Unless de-energized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers • Do not approach a previously undetected gas leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured • Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work | |
| <p><i>Chemical and material storage and use</i></p> | <ul style="list-style-type: none"> • Segregate and store incompatible chemicals separately. For example, store solvents and oxidizers (e.g., peroxides) separately, and acids and caustics separately • Secure compressed gas cylinders and ensure that they are stored properly when not in use (regulators off and valve caps on when not in use; separate oxygen and fuel gas by 20 feet or using a non-combustible barrier (5 ft high, fire-resistant rating of at least ½ hour)) • Store chemicals in containers approved and designed for chemical storage and mark all storage locations • Store and handle hazardous materials in areas with natural or forced ventilation; do not store or handle in low-lying areas • Isolate, secure and identify storage areas • Prohibit smoking near storage areas • Keep ignition sources at least 25 feet away from storage areas • Ensure that fire extinguishers and extinguishing agents are available in the immediate area • Bond and ground containers before dispensing flammable liquids. Reference 29 | <ul style="list-style-type: none"> • Gloves made of material that will protect user from chemicals handled • Face shield or goggles with indirect venting. If a face shield is selected, eye protection must be worn under the face shield • Coveralls or apron resistant to chemicals being handled • Disposable boot covers resistant to the chemicals being handled • A respirator and cartridges specific for chemical, as necessary |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | CFR 1926.152(e)(2) | |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> See the “General Health and Safety Provisions” section of this document | |
| <i>Noise</i> | <ul style="list-style-type: none"> Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Generator and compressor used for dive air-line systems</i> | <ul style="list-style-type: none"> Keep generator and compressor exhaust fumes away from and downwind of any diver air supply intakes Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure’s electrical system is not isolated, it may energize the utility’s wiring system for great distances and create a risk of electrocution for utility employees and others in the area Always plug electrical equipment directly into the generator using the manufacturer’s supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. Do not overload a generator; it can overheat and create a fire hazard Ground and bond generators according to the manufacturer’s recommendations; ensure that any manufacturer-required connections are secure before using the generator Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator’s fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen | <ul style="list-style-type: none"> Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|-------------------------------|
| | <ul style="list-style-type: none"> • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling • Before refueling, shut down the generator and allow it to cool | |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ Dive operations training as outlined in Subpart T of 29 CFR 1910 and Subpart Y of 29 CFR 1926.

Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry
- ❖ K- Operating over water
- ❖ L- Public safety (law enforcement and emergency medical services)

Other Resources and References

- ❖ 29 CFR 1910 Subpart T - General Industry Diving Regulations
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1910
- ❖ 29 CFR 1926 Subpart Y - Construction Industry Diving Regulations
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926.106 - Working over, or near water
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10669&p_table=STANDARDS
- ❖ 46 CFR - Coast Guard requirements for manning and safety equipment for inspected vessels
<http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=200546>

- ❖ OSHA Safety and Health Topics - Commercial Diving
<http://www.osha.gov/SLTC/commercialdiving/index.html>
- ❖ The Association of Diving Contractors International Consensus Standard (viewing copy only)
<http://www.adc-int.org/cons.htm>
- ❖ OSHA Fact Sheet – Using Portable Generator s Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf
- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf

➤ APPENDIX F- Dust control

- ❖ This appendix provides employees and supervisors with guidance for dust control to prevent injury and illness from dust inhalation. It is intended to be used in conjunction with the general guidance and requirements described in the first 15 pages of this HASP.
- ❖ During dry summer months employees are at greater risk for inhalation-related illness. One such example is Histoplasmosis infection from exposure to *Histoplasma capsulatum* fungal spores, which are endemic in the United States, especially along the Mississippi and Ohio River Valleys. It is associated with dried bird droppings and bat guano; the spores can become aerosolized during dry windy periods.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | | remediation). Filters with a charcoal layer may be used for odors |
| <i>Inhalation of dust</i> | <ul style="list-style-type: none"> • Evaluate work are for presence of roosting flocks of birds or bat colonies with residual manure. If present, donne appropriate PPE • Where applicable, use water spray to wet dry, dusty material to prevent aerosolization of dust • All earthmoving equipment (e.g., bulldozers, trucks, and front-end loaders) should have cabs with air conditioning (if available) to protect their operators • Air filters on air-conditioners should be inspected on a regular schedule and cleaned or replaced as needed • During filter cleaning or replacement of exceptionally dusty air filters, respiratory protection should be worn by the maintenance person if there is a potential for the dust to be aerosolized • Beds of all trucks carrying dirt or debris from a work site should be covered, and all trucks should pass through a wash station before leaving the site • When at a dump site, a truck operator should ensure that all individuals in the vicinity are in an area where they will not be exposed to dust aerosolized while the truck is emptied • During windy periods or other times when typical dust suppression techniques are ineffective, earthmoving activities should be interrupted | <ul style="list-style-type: none"> • Disposable protective clothing and shoe coverings should be worn whenever regular work clothing and shoes might be contaminated with dust containing H. capsulatum spores • During earthmoving activities at bird roosts or other work sites where the soil is known to be heavily contaminated by H. capsulatum, air-purifying, half-facepiece respirators should be worn by equipment operators to supplement dust suppression methods and the use of equipment with cabs. NIOSH recommends disposable and elastomeric, half-facepiece, air-purifying respirators (assigned protection factor: 10) • In extremely dusty conditions where air concentrations of H. capsulatum spores may be high, especially in enclosed spaces, NIOSH recommends the following respiratory protection Air-purifying, full-facepiece respirators; powered air-purifying respirators with half-facepiece or full facepiece; and continuous-flow, supplied-air respirators with half-facepiece or full facepiece (assigned protection factor: 50) |
| <i>Environmental hazards (e.g., heat stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |
| <i>Work zone safety and traffic control</i> | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| <i>within a work area</i> | | headwear for all employees |
| <i>General heavy equipment operation</i> | <ul style="list-style-type: none"> • Appendices C- Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document

Related Appendices

- ❖ A- Aerial lifting
- ❖ C- Crane operations
- ❖ D- Debris removal
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ NIOSH: Histoplasmosis: Protecting Employees at Risk - Revised Edition
<http://www.cdc.gov/elcosh/docs/d0600/d000679/d000679.html>

➤ APPENDIX G- Erecting temporary structures

- ❖ This appendix is for employees and supervisors establishing temporary structures, e.g. command post or housing facilities.
- ❖ For some operations or situations (e.g., heavy equipment use) other appendices also apply; see related appendices below.
- ❖ Establishing these temporary facilities will involve selecting the site and then using heavy equipment to clear the site, setting the temporary housing units (mobile homes or tents) in place, and building the supporting infrastructure. It also will involve many specially trained technicians to install electrical, water, and sanitation-related services.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
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| | | (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>General heavy equipment operation</i> | <ul style="list-style-type: none"> • See Appendices A- Aerial lifting, C- Crane operations, J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |
| <i>Work zone safety</i> | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| <p><i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i></p> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise come in contact with them • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables • Unless deenergized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers • Do not approach a previously undetected gas leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured • Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work | |
| <p><i>Working with electrical lines</i></p> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise; lines may become energized as a result of backfeed from portable generator use, circuit ties/switch point, lightning, or other downstream events • Ensure that all employees assessing and repairing electrical installations are qualified; a qualified employee is trained in and has demonstrated familiarity with the construction of the equipment to be accessed/repared and the hazards involved with their work | <ul style="list-style-type: none"> • For qualified electrical and telecommunications utility employees <ul style="list-style-type: none"> — Hard hat with appropriate ANSI rating for exposure to high voltage, as needed — Appropriately rated and tested electrician’s gloves, as needed — Non-conductive clothing, as needed — Personal fall arrest system including harnesses, |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------|---|---|
| | <ul style="list-style-type: none"> • Ensure that job briefings address hazards associated with the job, work procedures involved, special precautions, the potential for backfeed from portable generator use, energy source controls, and personal protective equipment (PPE) needs; conduct more detailed briefings for complex or unusual work • Lines thought to be deenergized may become energized for a number of reasons, including through backfeed; ensure that grounding procedures are accomplished and that all sources of electricity are isolated • Determine minimum approach distances, energy isolation techniques (e.g., lockout/ tagout, grounding, or equipotential zone needs), and electrical-specific PPE (gloves, face shields) needed based on the type and approximate voltage of service • Use live-line tools that are rated, pass visual inspection, and are up-to-date in their certification • Use fall-arrest, work-positioning, or travel-restricting equipment when working more than 4 feet above the ground on poles, towers, or similar structures without fall protection (cages, railings); fall protection equipment is not required to be used by a qualified employee climbing or changing location on poles, towers, or similar structures unless warranted by conditions (weather, design, or presence of hazards) • See Appendices H- Establishing communications systems; and I- Establishing power supply | <p>lanyards, lifelines, connectors, anchorages, and anchor points (as needed)</p> |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| <p><i>Improper ladder or scaffold use</i></p> | <ul style="list-style-type: none"> • Inspect ladders for cracked, broken, or defective parts before use • Do not exceed the load rating of ladders or scaffolds—remember that load ratings include people, tools, and equipment • Set up ladders and scaffolds on stable surfaces • Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height • Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines • Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away • Have a competent person inspect scaffolds before use. A competent person is able to recognize existing and predictable hazardous conditions and has the authority to take prompt corrective measures to eliminate the hazardous conditions • Ensure that the scaffold is level, and braced and guyed to prevent tipping, swaying, and displacement • Ensure that the scaffold is built on base plates and mud sills, or other firm foundations. Footings should be able to support the scaffold without settling or moving. Do not use unstable objects to support scaffolds. • Fully plank each scaffold on all working levels. For wood planking, use wood graded for the intended load. • Provide guardrails or fall protection systems on platforms 10 feet or higher | <ul style="list-style-type: none"> • Fall arrest systems on platforms without guardrails 10 feet or higher |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |
| <i>Silica, nuisance dust, dried mud, formaldehyde, or silt</i> | <ul style="list-style-type: none"> • Stay upwind of or away from dust-generating activities, and in particular those involving crystalline silica-containing materials like concrete, brick, tile, drywall, mortar, sand, or stone. When inhaled, the fine crystalline silica particles contained in the dust can become lodged deep in the lung, which can lead to silicosis and other respiratory illnesses • Use water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment, and demolishing structures • Avoid using compressed air for cleaning surfaces • Sample employee exposures to silica during dust-generating activities • New trailers and other manufactured housing may continue to off gas chemicals such as formaldehyde; sample employee exposures, as necessary • See Appendix F- Dust control | <ul style="list-style-type: none"> • At a minimum, use respirators with N, R, or P95 filters for work with crystalline silica-containing materials (e.g., concrete, brick, tile, mortar). The use of N, R, or P100 filters may provide additional protection. Higher levels of respiratory protection may be needed for some operations (e.g., cutting concrete, sandblasting, mixing concrete) • N, R, or P95 respirators may be used for nuisance dusts (e.g., dried mud, dirt, or silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors • Based on anticipated level of exposure, a respirator and cartridges for formaldehyde and other chemicals likely to off gas, as necessary |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <i>Falls from heights or through openings</i> | <ul style="list-style-type: none"> • Limit access/set up controlled access zones • Use fall protection systems: guardrails, safety nets, or fall arrest systems • Cover or guard holes and openings as soon as they are created. Covers must support two times the weight (body, equipment, materials) that may be imposed | <ul style="list-style-type: none"> • Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) |
| <i>Cuts and lacerations</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |
| <i>Noise</i> | <ul style="list-style-type: none"> • Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|-----------------------------|---|---|
| <p><i>Generator use</i></p> | <ul style="list-style-type: none"> • Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure's electrical system is not isolated, it may energize the utility's wiring system for great distances and create a risk of electrocution for utility employees and others in the area • Always plug electrical equipment directly into the generator using the manufacturer's supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. • Do not overload a generator; it can overheat and create a fire hazard • Ground and bond generators according to the manufacturer's recommendations; ensure that any manufacturer-required connections are secure before using the generator • Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy • Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling • Before refueling, shut down the generator and allow it to cool | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| <p><i>Chemical and material storage and use</i></p> | <ul style="list-style-type: none"> • Segregate and store incompatible chemicals separately. For example, store solvents and oxidizers (e.g., peroxides) separately, and acids and caustics separately • Secure compressed gas cylinders and ensure that they are stored properly when not in use (regulators off and valve caps on when not in use; separate oxygen and fuel gas by 20 feet or using a non-combustible barrier (5 ft high, fire-resistant rating of at least ½ hour)) • Store chemicals in containers approved and designed for chemical storage and mark all storage locations • Store and handle hazardous materials in areas with natural or forced ventilation; do not store or handle in low-lying areas • Isolate, secure and identify storage areas • Prohibit smoking near storage areas • Keep ignition sources at least 25 feet away from storage areas • Ensure that fire extinguishers and extinguishing agents are available in the immediate area • Bond and ground containers before dispensing flammable liquids. Reference 29 CFR 1926.152(e)(2) | <ul style="list-style-type: none"> • Gloves made of material that will protect user from chemicals handled • Face shield or goggles with indirect venting. If a face shield is selected, eye protection must be worn under the face shield • Coveralls or apron resistant to chemicals being handled • Disposable boot covers resistant to the chemicals being handled • A respirator and cartridges specific for chemical, as necessary |
| <p><i>Discovery of unknown chemicals</i></p> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> — Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area — Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <p><i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i></p> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document

Related Appendices

- ❖ A- Aerial lifting
- ❖ C- Crane operations
- ❖ F- Dust control
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ L-Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1910.142- Temporary labor camps
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9791
- ❖ 29 CFR 1926 Subpart P - Excavations
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926 Subpart X - Ladders
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926 Subpart L - Scaffolds
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926.550 - Cranes and Derricks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ 29 CFR 1910.134 - Respiratory Protection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=STANDARDS
- ❖ OSHA Safety and Health Topic – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>
- ❖ OSHA Fact Sheet - Working Safely Around Downed Electrical Wires
http://www.osha.gov/OshDoc/data_General_Facts/downed_electrical_wires.pdf
- ❖ OSHA Scaffolding eTool <http://www.osha.gov/SLTC/etools/scaffolding/index.html>
- ❖ OSHA Fact Sheet - Using Aerial Lifts http://www.osha.gov/OshDoc/data_Hurricane_Facts/aerial_lifts.pdf
- ❖ OSHA Quick Card - Crane Safety http://www.osha.gov/OshDoc/data_Hurricane_Facts/crane_safety.pdf
- ❖ OSHA Fact Sheet – Using Portable Generators Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf

- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf
- ❖ OSHA Fact Sheet - Preventing Falls http://www.osha.gov/OshDoc/data_Hurricane_Facts/fall.pdf
- ❖ OSHA Fact Sheet - Working Safely with Electricity
http://www.osha.gov/OshDoc/data_Hurricane_Facts/elect_safety.pdf
- ❖ OSHA Fact Sheet - Working Safely with Chain Saws
http://www.osha.gov/OshDoc/data_Hurricane_Facts/chainsaws.pdf
- ❖ Manual on Uniform Traffic Control Devices http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

APPENDIX H- Establishing communication systems

- ❖ This appendix addresses the assessment and restoration of communications systems. For some operations or situations (e.g., permit-required confined space entry, heavy equipment use) other appendices also apply; see related appendices linked below.
- ❖ Establishing communications system infrastructure often requires specially trained and qualified telecommunications employees. This work involves the use of specialized electrical-isolation equipment, frequent use of aerial lifts and ladders, and entry into enclosed and confined spaces.
- ❖ Employees involved in establishing communication systems should already be familiar with safe work practices and personal protective equipment applicable to restoring communications services. This appendix is intended to remind employees and supervisors of some of the hazards and suggested controls appropriate for establishing communications.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07 . It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| <i>Generally recommended for all hazards</i> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|---|
| | | used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>Working with communications systems</i> | <ul style="list-style-type: none"> • Assume that lines are live power lines until their voltages are tested and proven to be communications lines (lower voltage) • Ensure that all employees establishing communications systems are qualified for that work (e.g., first aid trained, understand PPE needs and minimum approach distances) • Ensure that communication systems lines are properly grounded • Prohibit climbing and working above the lowest level of electric power conductors unless a rigid fixed barrier is installed between the power and communications conductors or the power conductors carry less than 300 volts and are 40 or more inches below the communications conductors • Use fall-arrest, work-positioning, or travel-restricting equipment when working more than 4 feet above the ground on poles, towers, or similar structures without fall protection (cages, railings); fall-protection equipment is not required to be used by a qualified employee climbing or changing location on poles, towers, or similar structures unless warranted by conditions (e.g., weather, design, or presence of hazards) | <ul style="list-style-type: none"> • Hard hat with appropriate ANSI rating for exposure to voltages expected (as needed) • Appropriately rated and tested electrician’s gloves (as needed) • Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) |
| <i>Work zone safety</i> | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>Use of aerial lifts and general heavy equipment operation</i> | <ul style="list-style-type: none"> • See Appendices: A- Aerial lifting; and J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--------------------------------|--|---|
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |
| <i>Improper ladder use</i> | <ul style="list-style-type: none"> • Inspect ladders for cracked, broken, or defective parts before use • Do not exceed the load rating of ladders—remember that load ratings include people, tools, and equipment • Set up ladders on stable surfaces • Ensure that ladders are appropriately supported (ladder hooks) or lashed in place when working with communications system wires or poles • Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height • Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines • Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|-------------------------------|
| <p><i>Instability of structures and their supports</i></p> | <ul style="list-style-type: none"> • Ensure that a competent person inspects and determines that a supporting structure (pole, platform, ladder, walkway or other elevated structure) is adequately strong, in good condition, and properly secured before employees, materials, or equipment is supported by it. A competent person is able to recognize existing and predictable hazardous conditions and has the authority to take prompt corrective measures to eliminate the hazardous conditions • Do not climb poles or structures that are not adequately strong or in good conditions • If poles or structures are not considered adequately strong or in good condition: <ul style="list-style-type: none"> — Tag them in a conspicuous place — Secure them by guying, bracing or other means before climbing or accessing them | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| <i>Confined Spaces</i> | <ul style="list-style-type: none"> • Confined spaces have limited means of entry or exit, are large enough to bodily enter, and may contain physical (e.g., mechanical, electrical, hydraulic, pneumatic energy; engulfment hazards; inwardly converging surfaces) or atmospheric hazards (e.g., atmospheres that are oxygen-deficient or oxygen-enriched, contain or may contain flammable gas, vapor or mist, airborne combustible dust, toxic substances, or any other atmosphere that is immediately dangerous to life or health). Examples include storage tanks, process vessels, bins, boilers, vaults, ventilation or exhaust ducts, sewers, tunnels, pipelines, and pits more than 4 feet in depth • Hurricane-related events might introduce hazards or potential hazards into confined spaces. For example, a space might have a potential to contain a hazardous atmosphere due to the presence of decomposing organic matter, to the use of hazardous chemicals in the space, or to the performance of operations in the space, such as welding, cutting, or burning, that may create a hazardous atmosphere. Additional precautions must be taken to make the space safe for entry • Evaluate the need for entry (i.e., placing any body part into the space) • If entry is required, see Appendix B- Confined space entry | |
| <i>Electromagnetic or microwave radiation</i> | <ul style="list-style-type: none"> • Unless trained, do not enter any area posted with a red and black “Warning: Radio-frequency Radiation Hazard” warning sign • If trained, follow all administrative and engineering controls to ensure that exposure is maintained below the radiation protection guide | |
| <i>Falls from heights or through openings</i> | <ul style="list-style-type: none"> • Limit access/set up controlled access zones • Use fall protection systems: guardrails, safety nets, or fall arrest systems • Cover or guard holes and openings as soon as they are created. Covers must support two times the weight (body, equipment, materials) that may be imposed | <ul style="list-style-type: none"> • Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|-------------------------------------|---|---|
| <i>Work on, over, or near water</i> | <ul style="list-style-type: none"> • Use additional protections, such as a lifesaving skiff and a ring buoy as appropriate • See Appendix K- Operating over water | <ul style="list-style-type: none"> • All personnel should wear Coast Guard-approved Type I or II personal floatation devices • Watertight boots with steel toe and insole as needed |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|-----------------------------|---|---|
| <p><i>Generator use</i></p> | <ul style="list-style-type: none"> • Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure's electrical system is not isolated, it may energize the utility's wiring system for great distances and create a risk of electrocution for utility employees and others in the area • Always plug electrical equipment directly into the generator using the manufacturer's supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. • Do not overload a generator; it can overheat and create a fire hazard • Ground and bond generators according to the manufacturer's recommendations; ensure that any manufacturer-required connections are secure before using the generator • Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy • Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling • Before refueling, shut down the generator and allow it to cool | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|--|
| <i>Noise</i> | <ul style="list-style-type: none"> Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>See the “General Health and Safety Provisions” section of this document</i> | <ul style="list-style-type: none"> See the “General Health and Safety Provisions” section of this document | |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ All communications systems restoration employees should be qualified in accordance with 29 CFR 1910.268 - Telecommunications

Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry
- ❖ C- Crane operations
- ❖ F- Dust control
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ K- Operating over water
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1910.268 - Telecommunications
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9867
- ❖ 29 CFR 1910.1001 – Asbestos in General Industry
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9995

- ❖ 29 CFR 1926.1101 – Asbestos in Construction
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=STANDARDS
- ❖ 29 CFR 1926.550 - Cranes and Derricks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ OSHA Fact Sheet - Working Safely with Electricity
http://www.osha.gov/OshDoc/data_Hurricane_Facts/elect_safety.pdf
- ❖ OSHA Fact Sheet - Using Aerial Lifts
http://www.osha.gov/OshDoc/data_Hurricane_Facts/aerial_lifts.pdf
- ❖ OSHA Quick Card - Atmospheric Testing in Confined Spaces
http://www.osha.gov/OshDoc/data_Hurricane_Facts/atmospheric_test_confined.pdf
- ❖ NIOSH Interim Guidance: Working Safely in Confined Spaces
<http://www.cdc.gov/niosh/topics/flood/confined.html>
- ❖ OSHA Safety and Health Topics - Confined Spaces
<http://www.osha.gov/SLTC/confinedspaces/index.html>
- ❖ OSHA Safety and Health Topics – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>
- ❖ OSHA Fact Sheet – Using Portable Generators Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf
- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf
- ❖ Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

➤ APPENDIX I- Establishing power supply

- ❖ This appendix is for trained electrical utility employees and supervisors assessing and restoring electrical utility services. For some operations or situations (e.g., permit-required confined space entry, trenching, heavy equipment use) other appendices also apply; see related appendices below.
- ❖ Establishing electrical infrastructure requires specially trained and qualified technicians. This work will involve the use of specialized electrical-isolation equipment, frequent use of aerial lifts and ladders, and entry into confined spaces.
- ❖ The employees performing these tasks should already be familiar with safe work practices and personal protective equipment. This appendix is intended to remind these employees and their supervisors of some of the hazards associated with this work and of the suggested controls.
- ❖ Those individuals who are not specially trained and certified in electrical generation, transmission, and distribution systems should avoid contact with such equipment and work only a safe distance from it.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|--|
| | | <p>filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors</p> |
| <p><i>Working with electrical lines</i></p> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise; lines may become energized as a result of backfeed from portable generator use, circuit ties/switch point, lightning, or other downstream events • Ensure that all employees assessing and repairing electrical installations are qualified; a qualified employee is trained in and has demonstrated familiarity with the construction of the equipment to be accessed/repared and the hazards involved with their work • Ensure that job briefings address hazards associated with the job, work procedures involved, special precautions, the potential for backfeed from portable generator use, energy source controls, and personal protective equipment (PPE) needs; conduct more detailed briefings for complex or unusual work • Lines thought to be de-energized may become energized for a number of reasons, including through backfeed from portable generator use; ensure that grounding procedures are accomplished and that all sources of electricity are isolated • Determine minimum approach distances, energy isolation techniques (e.g., lockout/ tagout, grounding, or equipotential zone needs), and electrical-specific PPE (gloves, face shields) needed based on the type and approximate voltage of service • Use live-line tools that are rated, pass visual inspection, and are up-to-date in their certification | <ul style="list-style-type: none"> • Hard hat with appropriate ANSI rating for exposure to high voltage, as needed • Appropriately rated and tested electrician's gloves, as needed • Non-conductive clothing, as needed • Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | <ul style="list-style-type: none"> Use fall-arrest, work-positioning, or travel-restricting equipment when working more than 4 feet above the ground on poles, towers, or similar structures without fall protection (cages, railings); fall protection equipment is not required to be used by a qualified employee climbing or changing location on poles, towers, or similar structures unless warranted by conditions (weather, design, or presence of hazards) | |
| <i>Use of Aerial Lifts and General Heavy Equipment operation</i> | <ul style="list-style-type: none"> See Appendices: A- Aerial lifting; C- Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> Hearing protection—see Noise hazard When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |
| <i>Work zone safety</i> | <ul style="list-style-type: none"> See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>Confined Spaces</i> | <ul style="list-style-type: none"> Confined spaces have limited means of entry or exit, are large enough to bodily enter, and may contain physical (e.g., mechanical, electrical, hydraulic, pneumatic energy; engulfment hazards; inwardly converging surfaces) or atmospheric hazards (e.g., atmospheres that are oxygen-deficient or oxygen-enriched, contain or may contain flammable gas, vapor or mist, airborne combustible dust, toxic substances, or any other atmosphere that is immediately dangerous to life or health). Examples include storage tanks, process vessels, bins, boilers, vaults, ventilation or exhaust ducts, sewers, tunnels, pipelines, and pits more than 4 feet in depth Hurricane-related events might introduce hazards or potential hazards into confined spaces. For example, a space might have a potential to contain a hazardous atmosphere due to the | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--------------------------------|--|---|
| | <p>presence of decomposing organic matter, to the use of hazardous chemicals in the space, or to the performance of operations in the space, such as welding, cutting, or burning, that may create a hazardous atmosphere. Additional precautions must be taken to make the space safe for entry</p> <ul style="list-style-type: none"> • Evaluate the need for entry (i.e., placing any body part into the space) • If entry is required, see Appendix B- Confined space entry | |
| <i>Improper ladder use</i> | <ul style="list-style-type: none"> • Inspect ladders for cracked, broken, or defective parts before use • Do not exceed the load rating of ladders—remember that load ratings include people, tools, and equipment • Set up ladders on stable surfaces • Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height • Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines • Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away | |
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |
| <i>Work on, over, or near</i> | <ul style="list-style-type: none"> • Use additional protections, such as a | <ul style="list-style-type: none"> • All personnel should wear |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|----------------------|---|--|
| <i>water</i> | <p>lifesaving skiff and a ring buoy as appropriate</p> <ul style="list-style-type: none"> • See Appendix K- Operating over water | <p>Coast Guard-approved Type I or II personal flotation devices</p> <ul style="list-style-type: none"> • Watertight boots with steel toe and insole as needed |
| <i>Generator use</i> | <ul style="list-style-type: none"> • Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure's electrical system is not isolated, it may energize the utility's wiring system for great distances and create a risk of electrocution for utility employees and others in the area • Always plug electrical equipment directly into the generator using the manufacturer's supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. • Do not overload a generator; it can overheat and create a fire hazard • Ground and bond generators according to the manufacturer's recommendations; ensure that any manufacturer-required connections are secure before using the generator • Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy • Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator's fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|--|
| | <p>ensure adequate ventilation and cooling</p> <ul style="list-style-type: none"> • Before refueling, shut down the generator and allow it to cool | |
| <i>Noise</i> | <ul style="list-style-type: none"> • Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ All electrical restoration utility employees should be qualified in accordance with 29 CFR 1910.269.
- ❖ Job briefings prior to beginning the work (or prior to each day’s work or the start of each shift for repetitive assignments). Additional job briefings will be held if significant changes, which might affect the safety of the employees, occur during the course of the work.

Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry

- ❖ C- Crane operations
- ❖ F- Dust control
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communication systems
- ❖ J- Heavy equipment use
- ❖ K- Operating over water
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1910.269 - Electric Power Generation, Transmission, and Distribution
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9868
- ❖ 29 CFR 1926 Subpart V - Power Transmission and Distribution
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926 Subpart K - Electrical
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- 29 CFR 1926.550 - Cranes and Derricks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ OSHA Fact Sheet - Working Safely with Electricity
http://www.osha.gov/OshDoc/data_Hurricane_Facts/elect_safety.pdf
- ❖ OSHA Fact Sheet - Using Aerial Lifts
http://www.osha.gov/OshDoc/data_Hurricane_Facts/aerial_lifts.pdf
- ❖ OSHA Fact Sheet - Working Safely with Chain Saws
http://www.osha.gov/OshDoc/data_Hurricane_Facts/chainsaws.pdf
- ❖ OSHA Quick Card - Crane Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/crane_safety.pdf
- ❖ OSHA Quick Card - Atmospheric Testing in Confined Spaces
http://www.osha.gov/OshDoc/data_Hurricane_Facts/atmospheric_test_confined.pdf
- ❖ OSHA Safety and Health Topics - Confined Spaces
<http://www.osha.gov/SLTC/confinedspaces/index.html>
- ❖ NIOSH Interim Guidance: Working Safely in Confined Spaces
<http://www.cdc.gov/niosh/topics/flood/confined.html>
- ❖ OSHA Safety and Health Topics – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>

- ❖ OSHA Fact Sheet – Using Portable Generators Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf
- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf
- ❖ Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

➤ APPENDIX J- Heavy equipment use

- ❖ This appendix is for heavy equipment operators and their supervisors. It should be used in conjunction with the appendix for the activity in which the heavy equipment is being used (e.g. Crane operations).
- ❖ Various pieces of heavy equipment (bulldozers, backhoes, front-end loaders, dump trucks, and powered industrial trucks (PITs), such as fork lifts) will be used. While operators should be familiar with the proper use of such equipment, this appendix is provided to advise operators of common controls for hazards likely to be encountered.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|---|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | | nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>Traffic controls in and near work zones</i> | <ul style="list-style-type: none"> • See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>General heavy equipment operation (applicable to all heavy equipment use)</i> | <ul style="list-style-type: none"> • All vehicles must have: <ul style="list-style-type: none"> — A service brake system, an emergency brake system, and a parking brake system — Working headlights, tail lights, and brake lights — An audible warning device (horn) — Intact windshield with working windshield wipers • Ensure that all operators have been trained on the equipment they will use • Check vehicles at the beginning of each shift to ensure that the parts, equipment, and accessories are in safe operating condition. Repair or replace any defective parts or equipment prior to use • Do not operate vehicle in reverse with an obstructed rear view unless it has a reverse signal alarm capable of being heard above ambient noise levels or a signal observer indicates that it is safe to move • Vehicles loaded from the top (e.g., dump trucks) must have cab shields or canopies to protect the operator while loading • Ensure that vehicles used to transport employees have seats, with operable seat belts, firmly secured and adequate for the number of employees to be carried • Equipment should have roll-over protection and protection from falling debris hazards as needed • Prior to permitting construction equipment or vehicles onto an access roadway or grade, verify that the roadway or grade is constructed and maintained to safely accommodate the equipment and vehicles | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|---|
| | <ul style="list-style-type: none"> involved • Do not modify the equipment's capacity or safety features without the manufacturer's written approval • Where possible, do not allow debris collection work or other operations involving heavy equipment under overhead lines | |
| <i>Forklift and powered industrial truck (PIT) operations</i> | <ul style="list-style-type: none"> • Only handle loads within the rated capacity of the truck • Use rough-terrain trucks where conditions warrant their use • Carry loads low • When necessary, travel in reverse so the driver/operator has a clear view of the path of travel • Ascend or descend grades slowly; when ascending or descending grades in excess of 10 percent, loaded trucks should be driven with the load positioned upgrade • Ensure that forklifts/PITs are not modified without the written approval of the manufacturer • When left unattended, ensure that the load-engaging means are fully lowered, controls are neutralized, power is shut off, and brakes are set • Maintain a safe distance from edges, including those of ramps and platforms • Ensure that dockboards or bridgeplates are capable of withstanding the load imposed and that they are properly secured before the vehicle is slowly and carefully driven over it • Only use safety platforms approved by the manufacturer when lifting personnel. Ensure that the lifting platform is firmly secured to the lifting carriage and/or forks before lifting personnel | |
| <i>Material falling from vehicles</i> | <ul style="list-style-type: none"> • Do not overload vehicles • Ensure that loads are balanced and contained within the vehicle • Cover and secure loads before moving the vehicle | |
| <i>Silica, nuisance</i> | <ul style="list-style-type: none"> • Stay upwind of or away from dust- | <ul style="list-style-type: none"> • At a minimum, use |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------------------------------------|--|--|
| <i>dust, dried mud, or silt</i> | <p>generating activities, and in particular those involving crystalline silica-containing materials like concrete, brick, tile, drywall, mortar, sand, or stone. When inhaled, the fine crystalline silica particles contained in the dust can become lodged deep in the lung, which can lead to silicosis and other respiratory illnesses</p> <ul style="list-style-type: none"> • Use water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment, and demolishing structures • Avoid using compressed air for cleaning surfaces • Sample employee exposures to silica during dust-generating activities | <p>respirators with N, R, or P95 filters for work with crystalline silica-containing materials (e.g., concrete, brick, tile, mortar). The use of N, R, or P100 filters may provide additional protection. Higher levels of respiratory protection may be needed for some operations (e.g., cutting concrete, sandblasting, mixing concrete)</p> <ul style="list-style-type: none"> • N, R, or P95 respirators may be used for nuisance dusts (e.g., dried mud, dirt, or silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <i>Noise</i> | <ul style="list-style-type: none"> • Use heavy equipment with enclosed, temperature-controlled cabs, when available • Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Fueling</i> | <ul style="list-style-type: none"> • Ensure that ignition sources are at least 25 feet away from fueling areas • Prohibit smoking in fueling areas • Ensure that vehicles are attended while being fueled | <ul style="list-style-type: none"> • |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> — Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area — Take self-protective measures (i.e., | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|-------------------------------|
| | <p>move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area</p> | |
| <p><i>Environmental hazards</i> (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</p> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ OSHA heavy equipment-specific training requirements
- ❖ Personnel operating Powered Industrial Trucks (PITs) must be able to operate them safely and must demonstrate this competency by completing the training and evaluation requirements in 29. CFR 1910.178(l).

Related Appendices

- ❖ A- Aerial lifting
- ❖ C- Crane operations
- ❖ F- Dust control
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communications systems
- ❖ I- Establishing power supply
- ❖ L- Public safety (law enforcement and emergency medical services)
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1926 Subpart O - Motor Vehicles, Mechanized Equipment, and Marine Operations
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1926.251 - Rigging Equipment for Material Handling
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10686
- ❖ 29 CFR 1910.178 - Powered Industrial Trucks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9828
- ❖ OSHA Safety and Health Topics - Powered Industrial Trucks
<http://www.osha.gov/SLTC/powerindustrialtrucks/index.html>
- ❖ 29 CFR 1910.134 - Respiratory Protection
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=12716&p_table=STANDARDS

- ❖ OSHA Safety and Health Topics – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>
- ❖ Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

➤ APPENDIX K- Operating over water

- ❖ This appendix is for those who use or work from vessels to conduct SONS 07 activities.
- ❖ For some operations or situations (e.g., heavy equipment use, diving) other appendices also apply; see related appendices below.
- ❖ While many assessment-and-repair activities conducted from vessels or using vessels as platforms are similar to those carried out on land, some additional hazards may be present. Since most of this type of work will involve larger, Coast Guard-inspected commercial vessels, owner/operators should already be aware of vessel navigation-related safety and stability issues and applicable Coast Guard regulations.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------|---|-------------------------------|
|---------|---|-------------------------------|

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|---|
| <i>Vessel and barge operations</i> | <ul style="list-style-type: none"> • Comply with Coast Guard manning and safety equipment regulations (e.g., licensed/qualified staff based on size and service of the vessel, personal floatation devices, lifeboats, flares, charts for area of operation) applicable to the commercial operation of the vessel, including those related to vessel inspections (see Other Resources and References) • Ensure that vessels used to pull or push other platforms (e.g., barges) are of suitable design and horsepower • Take extra care when navigating because landmarks, navigational aids, and underwater hazards may have shifted. Also look for overhead hazards from tree limbs, hanging power lines, and other debris that may fall and/or strike employees • Use buoys to mark locations of submerged materials • Do not allow employees to pass fore, aft, over, between, and around barge decks unless there is a walkway or another means for safe passage • Provide fall protection if employees on a barge must stand at an outboard or inboard edge without sufficient bulwark, rail, coaming or other protection | <ul style="list-style-type: none"> • Coast Guard-approved Type I or II personal floatation devices |
| <i>Heavy equipment and Powered Industrial Truck use</i> | <ul style="list-style-type: none"> • Ensure that heavy equipment brought aboard a vessel will not affect the vessel's stability during any expected conditions of response/recovery operations (e.g., man lift extended to inspect a bridge trestle) • See Appendices: C- Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |
| <i>Diving operations</i> | <ul style="list-style-type: none"> • See Appendix E- Diving | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| <i>Power and hand tool use</i> | <ul style="list-style-type: none"> • Use ground-fault circuit interrupters (GFCIs) or double insulated power tools, or implement an assured equipment grounding program • Inspect power tool condition (including any cords) and verify operation of safety features before use • Do not use equipment that is defective, such as equipment with inoperable safety switches, missing guards, frayed/cut cords etc. • Ground power tools properly • Avoid standing in wet areas when using portable power tools | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard • Hand protection for cut- and abrasion-control and vibration dampening • Eye protection appropriate to the impact hazard |
| <i>Exposure to contaminated water and/or floodwaters</i> | <ul style="list-style-type: none"> • When a contaminated-water splash hazard is present (e.g., when divers are entering the water, when recovering submerged objects or debris), keep non-essential employees away from the splash-hazard zone • Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes • Ensure that cuts and bruises are protected from contact with contaminated water • Clean areas of the body that come in contact with contaminated water with soap and water, hand sanitizer, or sanitizing wipes • If divers are involved, ensure divers and their equipment are appropriately decontaminated (fresh water shower/rinse at minimum) upon completion of dive operations— see Diving and Diver-support Operations appendix (M-1) | <ul style="list-style-type: none"> • Goggles if routinely working near splashing floodwater • N, R, or P95 respirators may be necessary for exposure to contaminated water that may become aerosolized • Watertight boots with steel toe and insoles • Waterproof gloves for contact with contaminated water |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|-------------------------------|
| <p><i>Unsecured hazards in the work area</i></p> | <ul style="list-style-type: none"> • Remove or secure objects (glass, structural members) that may fall while employees work under them • Use debris netting, canopies, or catch platforms to reduce hazards from falling objects • Assess the presence, contents, and condition of tanks and equipment that might contain hazardous chemicals, gases, or flammable materials. If the condition of tanks or equipment is suspect, avoid disturbing them • Use air monitoring equipment to determine if the contents of the tanks or equipment are creating a hazardous atmosphere (e.g., flammable, combustible, corrosive, or toxic). When necessary, provide additional controls to protect employees (e.g., forced ventilation, respiratory protection) • Test and purge tanks and equipment that may be impacted by work operations | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|-------------------------------|---|-------------------------------|
| <p><i>Confined spaces</i></p> | <ul style="list-style-type: none"> • Confined spaces have limited means of entry or exit, are large enough to bodily enter, and may contain physical (e.g., mechanical, electrical, hydraulic, pneumatic energy; engulfment hazards; inwardly converging surfaces) or atmospheric hazards (e.g., atmospheres that are oxygen-deficient or oxygen-enriched, contain or may contain flammable gas, vapor or mist, airborne combustible dust, toxic substances, or any other atmosphere that is immediately dangerous to life or health). Examples include storage tanks, process vessels, bins, boilers, vaults, ventilation or exhaust ducts, sewers, tunnels, pipelines, and pits more than 4 feet in depth • Hurricane-related events might introduce hazards or potential hazards into confined spaces. For example, a space might have a potential to contain a hazardous atmosphere due to the presence of decomposing organic matter, to the use of hazardous chemicals in the space, or to the performance of operations in the space, such as welding, cutting, or burning, that may create a hazardous atmosphere. Additional precautions must be taken to make the space safe for entry • Evaluate the need for entry (i.e., placing any body part into the space) • For entry into maritime-related confined spaces (vessels and platforms), ensure that entry procedures account for potential hazards from adjacent spaces and piping systems in spaces, and from previous three cargoes handled • If entry is required, see Appendix B-Confined space entry | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|-------------------------------|
| <p><i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i></p> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become reenergized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise come in contact with them • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables • Unless de-energized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers • Do not approach a previously undetected gas leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured • Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|----------------------|---|---|
| <i>Generator use</i> | <ul style="list-style-type: none"> • Never attach a generator directly to the electrical system of a structure unless a qualified electrician has installed a transfer switch for the generator. If the structure’s electrical system is not isolated, it may energize the utility’s wiring system for great distances and create a risk of electrocution for utility employees and others in the area • Always plug electrical equipment directly into the generator using the manufacturer’s supplied cords or grounded (3-pronged) extension cords that are rated for the total anticipated load. • Do not overload a generator; it can overheat and create a fire hazard • Ground and bond generators according to the manufacturer’s recommendations; ensure that any manufacturer-required connections are secure before using the generator • Keep the generator dry; do not use it in wet or rainy conditions or protect it with a canopy • Carbon monoxide (CO) is a poisonous, colorless, and odorless gas that is produced by the incomplete burning of the generator’s fuel. CO is harmful when breathed because it displaces oxygen in the blood and deprives the heart, brain, and other vital organs of oxygen • Never use a generator indoors or in enclosed spaces such as garages and basements; opening windows and doors may not prevent CO from building up in those spaces. Do not use a generator outdoors near doors, windows, and vents that could allow CO to enter • Ensure that a generator has 3 to 4 feet of clear space on all sides and above it to ensure adequate ventilation and cooling • Before refueling, shut down the generator and allow it to cool | <ul style="list-style-type: none"> • Hearing protection—see Noise hazard |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|---|
| <i>Noise</i> | <ul style="list-style-type: none"> Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA. |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area Use a float/buoy to mark the location of the chemical container | <ul style="list-style-type: none"> Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i> | <ul style="list-style-type: none"> See the “General Health and Safety Provisions” section of this document | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ Ensure vessel personnel are licensed as needed.

Related Appendices

- ❖ B- Confined space entry
- ❖ C- Crane operations
- ❖ D- Debris removal
- ❖ E-Diving
- ❖ J- Heavy equipment use
- ❖ L- Public safety (law enforcement and emergency medical services)

Other Resources and References

- ❖ 46 CFR - Coast Guard requirements for manning and safety equipment for inspected vessels
- SONS 07 HASP

<http://www.access.gpo.gov/cgi-bin/cfrassemble.cgi?title=200546>

- ❖ 29 CFR 1915.14 - Hot work (OSHA Maritime Standard - Shipyards)
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10220
- ❖ 29 CFR 1915 Subpart B - Confined and Enclosed Spaces and Other Dangerous Atmospheres in Shipyard Employment
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12927
- ❖ 29 CFR 1926.106 - Working over or near water
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10669
- ❖ 29 CFR 1926 Subpart O - Motor Vehicles, Mechanized Equipment, and Marine Operations
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10767
- ❖ 29 CFR 1926.550 - Cranes and Derricks
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10760
- ❖ National Fire Protection Association Standard NFPA 306 - Control of Gas Hazards on Vessels (applicable to hot work and confined space entry)
<http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=306>
- ❖ OSHA Quick Card - Atmospheric Testing in Confined Spaces
http://www.osha.gov/OshDoc/data_Hurricane_Facts/atmospheric_test_confined.pdf
- ❖ NIOSH Interim Guidance: Working Safely in Confined Spaces
<http://www.cdc.gov/niosh/topics/flood/confined.html>
- ❖ OSHA Safety and Health Topics - Confined Spaces <http://www.osha.gov/SLTC/confinedspaces/index.html>
- ❖ OSHA Fact Sheet – Using Portable Generators Safely
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generator_safety.pdf
- ❖ OSHA Quick Card – Portable Generator Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_generators.pdf

➤ **APPENDIX L- Public safety (law enforcement and emergency medical services))**

- ❖ This appendix outlines the hazards to police and emergency medical services (EMS) personnel and other public officials who provide emergency response services.
- ❖ Under SONS 07 exercise conditions, public safety officials direct traffic, settle disputes, arrest criminals, and perform emergency medical services for injured and ill residents. They may travel in vehicles, boats, or on foot, depending on the local conditions.
- ❖ Employees conducting this operation may be employed by a variety of Federal, State, local, and private employers.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|---|--|
| <p><i>Generally recommended for all hazards</i></p> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | | <p>P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors</p> |
| <p><i>Vehicular traffic /Lack of traffic controls (traffic lights and signs)</i></p> | <ul style="list-style-type: none"> • Set up controls (temporary lights, 4-way stops, officer-directed traffic) at busy intersections • Use flashlights, flares, construction barriers, and cones to highlight road hazards and direct traffic flow | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees • Signaling wands/flashlights |
| <p><i>Unsecured hazards in the work area</i></p> | <ul style="list-style-type: none"> • Remove or secure objects (glass, structural members) that may fall while employees work under them • Use debris netting, sidewalk sheds, canopies, or catch platforms to reduce hazards from falling objects | |
| <p><i>Contact with blood or body fluids</i></p> | <ul style="list-style-type: none"> • Follow universal precautions, including washing any areas of the body or clothing that become contaminated with blood or bodily fluids • Wash hands with soap and water or an alcohol-based hand cleaner every time gloves are removed • Do not wear PPE or clothing that has been damaged or has been penetrated by body fluids • Report injuries and exposures to body fluid to supervisor • Decontaminate equipment before reuse; do not reuse gloves or other disposable PPE | <ul style="list-style-type: none"> • Fluid-proof gloves (e.g., latex, nitrile, rubber). Cover with heavy-duty work gloves if potential for cuts and abrasions (e.g., moving debris) • Protective clothing appropriate for preventing blood penetrating to underlying skin/clothing |
| <p><i>Contact with downed lines and live electrical equipment and other utilities (e.g., gas, water)</i></p> | <ul style="list-style-type: none"> • Assume that electrical lines are energized until proven otherwise. Lines and other conductors may become re-energized without warning as utilities are evaluated and restored after a disaster • Inspect the work area for downed conductors and do not go near, drive over, or otherwise come in contact with them • Downed electrical conductors can energize other objects, including fences, water pipes, bushes, trees, and telephone/CATV/fiber optic cables. • Unless deenergized and visibly grounded, maintain proper distance from overhead electrical power lines (at least 10 feet) and/or provide insulating barriers | |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| | <ul style="list-style-type: none"> Do not approach a previously undetected gas leak; if a gas leak is detected, secure spark-producing devices (e.g., engines, tools, electronic, and communications equipment) and evacuate the area until the leak is secured Contact utility company to assist in locating, marking, and shutting off/purging utility lines that may pose a hazard to employees or may be impacted; ensure that lines have been purged as needed before beginning work | |
| <i>General heavy equipment operation</i> | <ul style="list-style-type: none"> See Appendices: A- Aerial lifting; C- Crane operations; and J- Heavy equipment use | <ul style="list-style-type: none"> Hearing protection—see Noise hazard When working from an aerial lift, use a body harness that is properly attached (or body belt for tethering or restraint use only) for fall protection |
| <i>Work zone safety</i> | <ul style="list-style-type: none"> See Appendix M- Traffic and work zone safety | <ul style="list-style-type: none"> ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees |
| <i>Discovery of unknown chemicals</i> | <ul style="list-style-type: none"> If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area See Hazardous Waste Operations and Emergency Response (HAZWOPER) appendix (O-7) | <ul style="list-style-type: none"> Evaluate the need to revise protective clothing, respirator, and glove selection |
| <i>Slips, trips, and falls on working surfaces</i> | <ul style="list-style-type: none"> See the “General Health and Safety Provisions” section of this document) | |
| <i>Work on, over, or near water</i> | <ul style="list-style-type: none"> Use grappling poles to retrieve floating objects Use buoys to mark underwater diving locations or locations of submerged materials Use additional protections, such as a lifesaving skiff and a ring buoy, as appropriate See Appendix K- Operating over water | <ul style="list-style-type: none"> Coast Guard-approved Type I or II personal flotation devices Watertight boots with steel toe and insoles |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---------------------------------|--|---|
| <i>Improper ladder use</i> | <ul style="list-style-type: none"> • Inspect ladders for cracked, broken, or defective parts before use • Do not exceed the load rating of ladders—remember that load ratings include people, tools, and equipment • Set up ladders on stable surfaces • Set extension or straight ladders at a 75 degree angle from the ground (1/4 foot back for every foot of rise) and provide 3 feet above an upper landing surface to ease climbing onto/descending from height • Use non-conductive ladders (e.g., fiberglass) and exercise extreme caution when working near power lines • Secure ladders that can be displaced by work activities; consider barricades at the base to keep traffic away | |
| <i>Diving operations</i> | <ul style="list-style-type: none"> • See Appendix E- Diving | |
| <i>Confined spaces</i> | <ul style="list-style-type: none"> • Confined spaces have limited means of entry or exit, are large enough to bodily enter, and may contain physical (e.g., mechanical, electrical, hydraulic, pneumatic energy; engulfment hazards; inwardly converging surfaces) or atmospheric hazards (e.g., atmospheres that are oxygen-deficient or oxygen-enriched, contain or may contain flammable gas, vapor or mist, airborne combustible dust, toxic substances, or any other atmosphere that is immediately dangerous to life or health). Examples include storage tanks, process vessels, bins, boilers, vaults, ventilation or exhaust ducts, sewers, tunnels, pipelines, and pits more than 4 feet in depth • Hurricane-related events might introduce hazards or potential hazards into confined spaces. For example, a space might have a potential to contain a hazardous atmosphere due to the presence of decomposing organic matter, to the use of hazardous chemicals in the space, or to the performance of operations in the space, such as welding, cutting, or burning, that may create a hazardous atmosphere. Additional precautions must be taken to make the space safe for entry • Evaluate the need for entry (i.e., placing any body part into the space) • If entry is required, see Appendix B- Confined space entry | |
| <i>Exposure to contaminated</i> | <ul style="list-style-type: none"> • Reduce the exposure to splash or aerosolized liquid hazards by limiting the number of people in the area | <ul style="list-style-type: none"> • Goggles if routinely working near splashing |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|---|--|--|
| <i>water and/or floodwaters</i> | <p>and having those in the area stay upwind of water discharge areas</p> <ul style="list-style-type: none"> • Ensure that good hygiene, especially hand washing, is practiced before eating, drinking, and smoking. If clean water is not available, use an alternative such as hand sanitizer or sanitizing wipes • Ensure that cuts and bruises are protected from contact with contaminated water • Clean areas of the body that come in contact with contaminated water with soap and water, hand sanitizer, or sanitizing wipes | <p>floodwater</p> <ul style="list-style-type: none"> • N, R, or P95 respirators may be necessary for exposure to contaminated water that may become aerosolized • Watertight boots with steel toe and insoles • Waterproof gloves for contact with contaminated water |
| <i>Falls from heights or through openings</i> | <ul style="list-style-type: none"> • Limit access/set up controlled access zones • Use fall protection systems: guardrails, safety nets, or fall arrest systems • Cover or guard holes and openings as soon as they are created. Covers must support two times the weight (body, equipment, materials) that may be imposed | <ul style="list-style-type: none"> • Personal fall arrest system including harnesses, lanyards, lifelines, connectors, anchorages, and anchor points (as needed) |
| <i>Noise</i> | <ul style="list-style-type: none"> • Place generators, compressors, and other noisy equipment at a distance or behind a barrier when possible | <ul style="list-style-type: none"> • Hearing protection when working around potential noise sources and when noise levels exceed 90 dBA. A useful “rule of thumb”—if you cannot hold a conversation in a normal speaking voice with a person who is standing at arms length (approximately 3 feet), the noise level may exceed 90 dBA |
| <i>Cuts and lacerations</i> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |
| <i>Silica, mold, nuisance dust, dried mud, and silt</i> | <ul style="list-style-type: none"> • Stay upwind of or away from dust-generating activities, and in particular those involving crystalline silica-containing materials like concrete, brick, tile, drywall, mortar, sand, or stone. When inhaled, the fine crystalline silica particles contained in the dust can become lodged deep in the lung, which can lead to silicosis and other respiratory illnesses • Use water spray or mist to suppress dust generation, especially during operations that may create a lot of dust, such as cutting or sawing silica-containing materials, jack hammering, impact drilling, using heavy equipment, and demolishing structures | <ul style="list-style-type: none"> • At a minimum, use respirators with N, R, or P95 filters for work with crystalline silica-containing materials (e.g., concrete, brick, tile, mortar). The use of N, R, or P100 filters may provide additional protection. Higher levels of respiratory protection may be needed for some |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | <ul style="list-style-type: none"> • Avoid using compressed air for cleaning surfaces • Sample employee exposures to silica during dust-generating activities • Limit contact or disturbance of surfaces containing substantial visible mold growth • See Appendix F- Dust control | <p>operations (e.g., cutting concrete, sandblasting, mixing concrete)</p> <ul style="list-style-type: none"> • N, R, or P95 respirators may be used for nuisance dusts (e.g., dried mud, dirt, or silt) and mold (except mold remediation). Filters with a charcoal layer may be used for odors |
| <p><i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i></p> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document | |

Additional Medical Needs

- ❖ Employees likely to contact blood and body fluids (medical and search-and-rescue personnel) should be vaccinated against hepatitis B.

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document
- ❖ Employees who may be exposed to blood or other potentially infected materials (OPIM) through contact with bleeding, injured, or sick victims must be provided with initial and annual training on bloodborne pathogens and the organization’s exposure control plan, in accordance with 29 CFR 1910.1030(g).
- ❖ Public Safety personnel who are likely to respond to an emergency involving the release or potential release of a hazardous substance (e.g., oil or gasoline, chlorine, pesticides, corrosives, other chemicals) must be trained to perform their role as outlined in the Hazardous Waste Operations and Emergency Response (HAZWOPER) standard, 29 CFR 1910.120(q)(6) or 29 CFR 1926.65(q)(6). Personnel who are likely to witness or discover a release, initiate an emergency response sequence, and take no further action must receive training equivalent to the “first responder awareness level.” Personnel who will take defensive action without trying to stop the release must have training equivalent to the “first responder operations level.” Personnel who will respond to stop the spill must receive additional training under HAZWOPER(q)(6).

Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry
- ❖ C- Crane operations
- ❖ D- Debris removal
- ❖ E-Diving

- ❖ F- Dust control
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ K- Operating over water
- ❖ M- Traffic and work zone safety

Other Resources and References

- ❖ 29 CFR 1926.106 - Working over, or near water
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10669&p_table=STANDARDS
- ❖ 29 CFR 1926 Subpart M - Fall Protection
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1910.23 - Guarding of Floor and Wall Openings
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9715
- ❖ 29 CFR 1926 Subpart X - Ladders
http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ❖ 29 CFR 1910.1030 - Bloodborne Pathogens
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051
- ❖ 29 CFR 1910.120 - Hazardous Waste Operations and Emergency Response
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9765
- ❖ OSHA Fact Sheet - General Decontamination
http://www.osha.gov/OshDoc/data_Hurricane_Facts/general_decontamination_fact.pdf
- ❖ NIOSH Traumatic Incident Stress – Information for Emergency Response Employees
<http://www.cdc.gov/niosh/unp-trinstrs.html>
- ❖ OSHA Quick Card - Portable Ladder Safety Tips
http://www.osha.gov/OshDoc/data_Hurricane_Facts/portable_ladder_safety.pdf
- ❖ OSHA Fact Sheet - Preventing Falls
http://www.osha.gov/OshDoc/data_Hurricane_Facts/fall.pdf
- ❖ OSHA Fact Sheet - Working Safely Around Downed Electrical Wires
http://www.osha.gov/OshDoc/data_General_Facts/downed_electrical_wires.pdf
- ❖ OSHA Safety and Health Topics - Confined Spaces
<http://www.osha.gov/SLTC/confinedspaces/index.html>
- ❖ OSHA Quick Card - Atmospheric Testing in Confined Spaces
http://www.osha.gov/OshDoc/data_Hurricane_Facts/atmospheric_test_confined.pdf
- ❖ NIOSH Interim Guidance: Working Safely in Confined Spaces
<http://www.cdc.gov/niosh/topics/flood/confined.html>

- ❖ OSHA Quick Card - Work Zone Traffic Safety
http://www.osha.gov/OshDoc/data_Hurricane_Facts/work_zone_safety.pdf
- ❖ Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm
- ❖ OSHA Safety and Health Topics – Respiratory Protection
<http://www.osha.gov/SLTC/respiratoryprotection/index.html>
- ❖ NIOSH Respirator Selection Logic <http://www.cdc.gov/niosh/docs/2005-100/>

➤ APPENDIX M- Traffic and work zone safety

- ❖ This appendix is for all employees who will work in and around roadways and who may need to set up work zones as protection from oncoming vehicular traffic. It is also for employees operating or working near heavy equipment who will need to establish and follow traffic safety procedures to avoid injury and equipment damage.
- ❖ For some operations or situations other appendices also apply; see related appendices below.
- ❖ While OSHA requires that operators be familiar with the pieces of machinery they operate, there is also a need to implement controls to ensure these activities are performed safely. Controls are needed where multiple pieces of heavy equipment, vehicles, and employees are in close proximity.

About the Appendix: This document is intended as a quick reference for agencies and employees. It highlights many of the likely and potentially highest risk hazards associated with any task/operation during SONS 07. It also recommends beneficial work practices, personal protective equipment (PPE), and other exposure control methods for protecting employees. Agencies must evaluate the specific hazards associated with this task/operation at the site where this work is performed. When additional exposure controls are necessary to adequately protect employees, agencies must provide them. For additional information, consult applicable standards, manufacturer operating instructions, and hurricane-related fact sheets and websites.

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|--|
| <i>Generally recommended for all hazards</i> | <ul style="list-style-type: none"> • See the sections entitled: “Organization Responsibilities” and “General Health and Safety Provisions” | <ul style="list-style-type: none"> • The general PPE is recommended for all tasks/operations; only the additional PPE that may be needed for a specific hazard is noted below • General PPE includes: <ul style="list-style-type: none"> — Hard hat for overhead impact or electrical hazards — Eye protection with side shields — Gloves chosen for job hazards expected (e.g., heavy-duty leather work gloves for handling debris with sharp edges and/or chemical protective gloves appropriate for chemicals potentially contacted) — ANSI-approved protective footwear — Respiratory protection as necessary—N, R, or P95 filtering facepieces may be used for nuisance dusts (e.g., dried mud, dirt, and silt) and mold (except mold |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|---|---|
| | | remediation). Filters with a charcoal layer may be used for odors |
| <i>Protecting employees from vehicular traffic</i> | <ul style="list-style-type: none"> • Develop and use a site plan that provides traffic flow details (see traffic flow diagrams on page 5; other Manual on Uniform Traffic Control Devices (MUTCD) model plans are available at www.fhwa.gov, see Other Resources) • Use flaggers, traffic cones, and/or highway channeling devices to steer traffic away from employees along the roadway (see flagger guidance on page 4) • Use flaggers, standard road signs (e.g., “work zone ahead”), or message boards to warn approaching vehicles of work area • Give motorists plenty of warning of upcoming work zones; place the first warning signs at a distance calculated as 4 to 8 times (in feet) the speed limit (in MPH)—use a higher multiplier for higher speed areas (e.g., a 15 MPH road should have its first warning sign at least 60 feet from the work zone, while a work zone needed in a 65 MPH zone should have its first sign approximately 520 feet away) • Ensure that the work zone is well lit, but control glare to avoid temporarily blinding employees or passing motorists | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees • Signaling, slow/stop signs, or wands/flashlights for flaggers providing traffic control outside the work zone |
| <i>Traffic control within work area</i> | <ul style="list-style-type: none"> • Develop and use a site plan that provides traffic flow details • Limit access, barricade, or set up controlled access zones where the equipment will be used; for equipment that rotates and/or carries/dumps loads, create an access zone that extends beyond the maximum rotation/swing radius of the equipment and/or beyond the area where loads will be carried/dumped • Establish/follow traffic control patterns (e.g., cones, barrels, barricades) in work areas • Use spotters where visibility is limited • Do not drive in reverse gear with an obstructed rear view unless the vehicle has an audible alarm or a signaler is used • Ensure that spotters and heavy equipment operators have communications equipment or agree on and use hand signals • Employees and other pedestrians should make eye contact with heavy equipment operators | <ul style="list-style-type: none"> • ANSI/ISEA 107-2004 compliant high visibility safety apparel and headwear for all employees • Signaling, slow/stop signs, or wands/flashlights for flaggers providing traffic control within the work zone |

| Hazards | Key Engineering Controls and Work Practices | Personal Protective Equipment |
|--|--|--|
| | <p>before proceeding near equipment or operating areas</p> <ul style="list-style-type: none"> • Train employees not to position themselves between mechanical equipment and a fixed object • Provide barricades around excavations and structures such as debris reduction observation towers | |
| <p><i>Discovery of unknown chemicals</i></p> | <ul style="list-style-type: none"> • Inspect area for hazardous chemical containers before beginning the cleaning phase • If hazardous chemical containers are found or leaking materials are detected: <ul style="list-style-type: none"> — Do not use spark-producing devices (e.g., engines, tools, electronic, and communications equipment) in the immediate area — Take self-protective measures (i.e., move to a safe distance upwind) and contact hazardous material response personnel for evaluation/removal before continuing work in the area | <ul style="list-style-type: none"> • Evaluate the need to revise protective clothing, respirator, and glove selection |
| <p><i>Environmental hazards (e.g., heat/cold stress, sunburn, poisonous plants, animal/insect bites)</i></p> | <ul style="list-style-type: none"> • See the “General Health and Safety Provisions” section of this document) | |

Additional Training Needs

- ❖ Follow general site- and task-specific training guidelines as outlined in the "Organization Responsibilities" section of this document

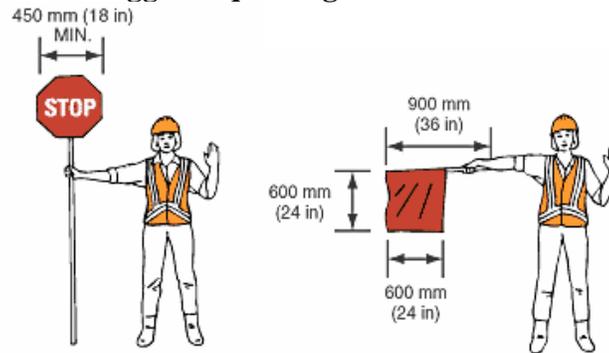
Related Appendices

- ❖ A- Aerial lifting
- ❖ B- Confined space entry
- ❖ C- Crane operations
- ❖ D- Debris removal
- ❖ F- Dust control
- ❖ G- Erecting temporary structures
- ❖ H- Establishing communication systems
- ❖ I- Establishing power supply
- ❖ J- Heavy equipment use
- ❖ L- Public safety (law enforcement and emergency medical services)

Other Resources and References

- ❖ Manual on Uniform Traffic Control Devices
http://mutcd.fhwa.dot.gov/kno-millennium_12.28.01.htm

Flagger requesting vehicles STOP



A flagger must:

- Stand either on the shoulder adjacent to the road user being controlled or in the closed lane prior to stopping road users.
- Be clearly visible to the first approaching road user at all times. The flagger also should be visible to other road users.
- Be stationed sufficiently in advance of the employees to warn them (for example, with audible warning devices such as horns or whistles) of approaching danger by out-of-control vehicles.
- Stand alone, never permitting a group of employees to congregate around the flagger station.

Flagger requesting vehicles PROCEED SLOWLY

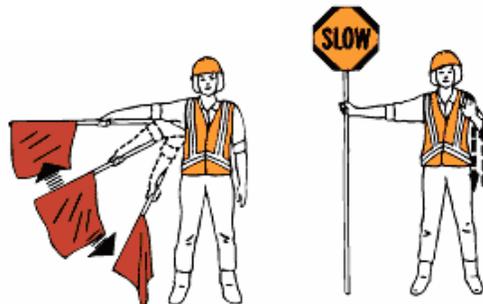


Figure 6C-1. Component Parts of a Temporary Traffic Control Zone

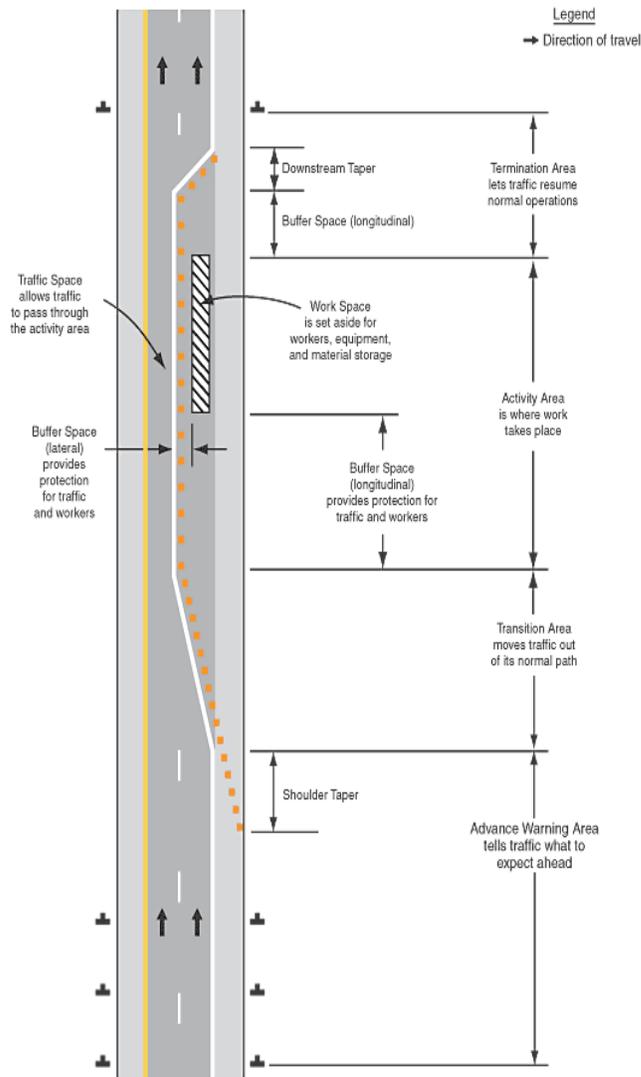
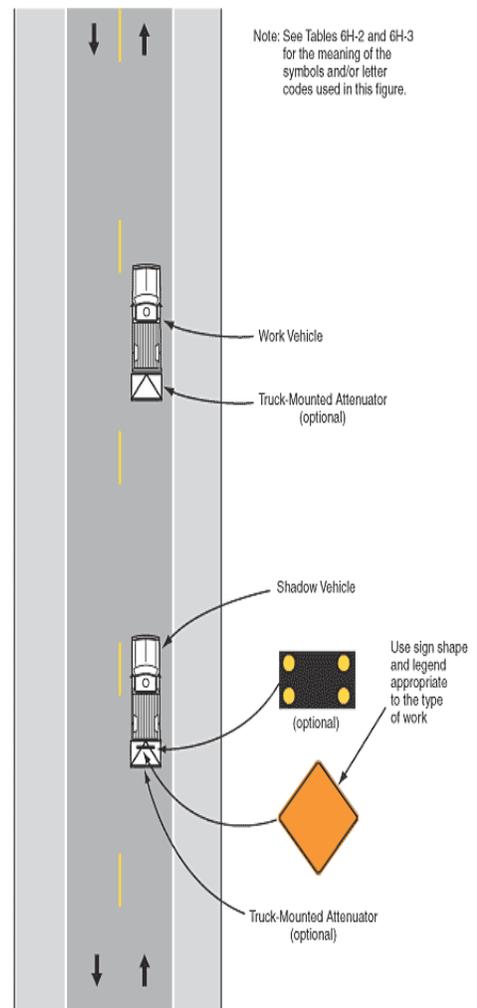


Figure 6H-17. Mobile Operations on Two-Lane Road (TA-17)



Typical Application 17

