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Oak Ridge LLC

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SAFELY DELIVERING THE DEPARTMENT OF ENERGY'S VISION  
FOR THE EAST TENNESSEE TECHNOLOGY PARK MISSION

**Safety and Health Handbook,  
Oak Ridge, Tennessee**

This document is approved for public  
release per review by:

Teresa D. Fancher

1/25/17

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UCOR Classification &  
Information Control Office

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**Safety and Health Handbook,  
Oak Ridge, Tennessee**

Date Issued—[February 2017]

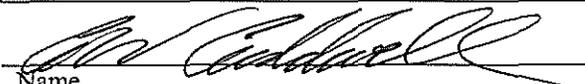
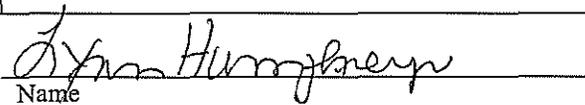
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URS | CH2M Oak Ridge LLC  
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## APPROVALS

<b>Safety and Health Handbook, Oak Ridge, Tennessee</b>	<b>UCOR-4087/R1</b>
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## REVISION LOG

Revision Number	Description of Changes	Pages Affected
1	Full document update. Additional sections added to include: HPI, LSIT, Prohibited Items, Tobacco Policy, Inclement Weather, Pedestrian Safety, Temperature Extremes, Biological Hazard Protection, and Working Over or Near Water.	All
0	Initial issue of document.	All



**UCOR**  
URS | CH2M  
Oak Ridge LLC

# Safety and Health Handbook

## February 2017



## ***SAFETY CONSCIOUS WORK ENVIRONMENT***

URS | CH2M Oak Ridge LLC (UCOR) is committed to foster and maintain a safe work environment. Additionally, UCOR and the Department of Energy Oak Ridge Office of Environmental Management (OREM) are committed to maintain a safety-conscious work environment in all facilities and for all work. This is based on the following principles:

- *Safety is a prerequisite for all work. Our expectation is that each employee goes home in the same condition that he or she came to work. Our goal is zero injuries.*
- *All employees are encouraged and expected to promptly report all injuries, illnesses, and environmental incidents.*
- *All employees are encouraged and expected to have a questioning attitude and stop work if they feel a job cannot be done safely or the environment is threatened.*
- *All members of the OREM and UCOR leadership team, up to and including the OREM Manager and the UCOR President and Project Manager, have an open door policy, especially pertaining to safety.*
- *Employees have, and are encouraged and expected to use, multiple venues to express safety concerns. These include but are not limited to their management chain and Employee Concerns.*
- *Employee involvement is the cornerstone of our safety culture and is essential to the successful implementation of the Integrated Safety Management System (ISMS), Nuclear Safety, the Voluntary Protection Program, Behaviour Based Safety, and other ESH&QA program elements.*

Employees are encouraged to raise safety issues and concerns without fear of reprisal. The OREM/UCOR leadership team will address and resolve issues and concerns in a timely manner.

**URS | CH2M Oak Ridge LLC**

***Safety and Health  
Handbook***

***February 2017***



**UCOR**  
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Oak Ridge LLC



**OUR SAFETY CULTURE**

Safety is a prerequisite for all work being performed by UCOR and our subcontractors. We are committed to ensuring the safety of our employees and protection of the environment as we work to clean up the Oak Ridge Reservation. Our Integrated Safety Management System brings together environment, safety, and health into management and work practices at all levels. Employee involvement is a critical component of this system. We empower employees to stop work whenever they feel something is unsafe or are unsure. We embrace a questioning attitude amongst our UCOR team members and encourage feedback and participation at all levels of the company. As we look toward the many upcoming tasks and challenges, safety will always be the foundation upon which we build our success – Every task, Every Activity, Every Time.

Ken Rueter, President and Project Manager  
URS | CH2M Oak Ridge LLC (UCOR)



***Constructive feedback that will improve our Safety and Health Program is always welcome. If you have a suggestion, discuss it with your supervisor, project ESH Operations Manager, or UCOR Safety and Health Manager.***

***Note:*** *This handbook is designed to identify the general hazards and controls for all employees, and where necessary, will reference additional resources needed to safely and compliantly perform the work. Work documents and procedures supplement this handbook for task specific hazards and controls.*

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## **ZERO ACCIDENT PHILOSOPHY**

UCOR is dedicated to the concept that all accidents are preventable. Accordingly, the company is committed to achieving and sustaining "Zero Accident Performance" through continuous improvement practices.

### **Objectives**

- Strive to eliminate all injuries, illnesses, and adverse impacts to the environment.
- Promote environmental, safety, and health objectives as a constant value in designing, planning, training, and executing work.
- Spread ownership for environment, safety, and health program effectiveness throughout the Team.
- Enhance employee awareness and involvement in our environment, safety, and health program implementation.
- Increase employees' consistent use of safe practices in their daily work activities.
- Optimize the use of continuous improvement practices as the basis for "Zero Accident Performance" initiatives.
- Demonstrate to customers that UCOR is "Dedicated to Safety Excellence."
- Select and mentor subcontractors that are committed to "Zero Accident Performance."

### **Ownership**

- Senior Management demonstrates leadership and direction for "Zero Accident Performance" implementation.
- All UCOR employees and subcontractors are empowered to implement and consistently strive for the "Zero Accident Performance" goal.
- UCOR Functional Managers develop policy, provide technical direction, and coordinate supporting services in partnership with the customer to help achieve safety excellence.

***Ownership (cont.)***

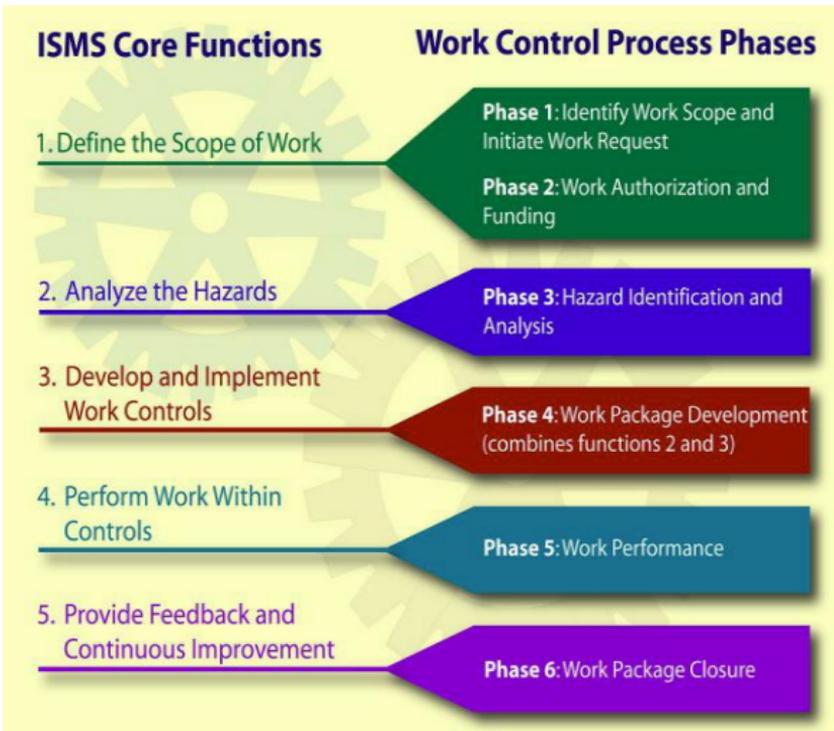
- The UCOR Environmental, Safety and Health (ESH) Programs manage, develop, and deploy Safety and Health (S&H) resources to support project and functional teams and provide guidance and assistance in implementing the strategy and principles of the Integrated Safety Management System (ISMS).
- Operations personnel actively implement, promote and enforce “Zero Accident Performance” within their work teams, encouraging personal and group ownership of the safety culture.

## **INTEGRATED SAFETY MANAGEMENT SYSTEM AND WORK CONTROL PROCESS**

The objective of ISMS is to integrate ES&H controls into all levels of the work (including planning) through implementation of PROC-FS-1001, *Integrated Work Control Program*, so that workers, the public, and the environment are protected while our missions are accomplished.

### ***Eight Guiding Principles of the Integrated Safety Management System***

1. Line management responsibility for safety.
2. Clear roles and responsibilities.
3. Competence commensurate with responsibilities.
4. Balanced priorities.
5. Identification of safety standards and requirements.
6. Hazard controls tailored to work being performed.
7. Operations authorization.
8. Worker involvement.



**HUMAN PERFORMANCE IMPROVEMENT (HPI)**

UCOR actively seeks to set up each worker and task for success versus failure. Workers are asked to look for error-likely situations (when multiple error precursors are present) and implement tools at appropriate times to reduce the frequency or consequences of errors. Below are error precursors and tools (for individuals and teams) that can be used to reduce errors and incidents.

<b>Error Precursors</b>
-------------------------

<b>Task Demands</b>	<b>Individual Capabilities</b>
Time pressure (in a hurry)	Unfamiliarity w/ task / First time
High Workload (memory requirements)	Lack of knowledge (mental model)
Simultaneous, multiple tasks	New technique not used before
Repetitive actions, monotonous	Imprecise communication habits
Irrecoverable acts	Lack of proficiency / Inexperience
Interpretation requirements	Indistinct problem-solving skills
Unclear goals, roles, & responsibilities	"Hazardous" attitude for critical tasks
Lack of or unclear standards	Illness / Fatigue
<b>Work Environment</b>	<b>Human Nature</b>
Distractions / Interruptions	Stress (limits attention)
Changes / Departures from routine	Habit patterns
Confusing displays or controls	Assumptions (inaccurate mental)
Workarounds / OOS instruments	Complacency / Overconfidence
Hidden system response	Mindset ("tuned" to see)
Unexpected equipment conditions	Inaccurate risk perception (Pollyanna)
Lack of alternative indication	Mental shortcuts (biases)
Personality conflicts	Limited short-term memory

Below is a table of the most common HPI/Work Control tools that can be utilized to effectively reduce errors.

<b>Tools for Individuals</b>	<b>Tools for Teams</b>
Job-Site Review	Pre-job Briefing
Questioning Attitude	Verification Practices- Peer-checking, Concurrent, & Independent
Stop when Unsure	
Self-Checking	
Procedure use & Adherence	Flagging
Effective Communication	Effective Turnover
Placekeeping	Post-Job Review

***STOP WORK AUTHORIZATION***

The authority and responsibility to stop work is extended to all UCOR and subcontractor employees. Without fear of reprisal, employees are encouraged to approach all work with a high degree of inquisitiveness and to satisfy themselves that it is safe to proceed.



Management empowers all employees to refuse to perform work that is unsafe, even if directed to do so by supervisors, customers, or other prime contractors on shared sites. Work that is suspected or proven to place workers, the public, or the environment at risk shall be stopped until it can be demonstrated that it is safe to proceed with the work.

***LOCAL SAFETY IMPROVEMENT TEAM (LSIT)***

Local Safety Improvement Teams (LSIT) provide an avenue for employees to contribute to the safety program, promote continuous safety improvement, promote safety awareness and sharing of lessons learned, and provide an intense focus on safety issues from an employee perspective. The LSIT encourages employee feedback and involvement, fosters open communication, and develops mutual trust and confidence.

***EMPLOYEE CONCERNS PROGRAM (ECP)***

The UCOR ECP is a supplemental, independent avenue for prompt identification, reporting, and resolution of concerns. Concerns may relate- but are not limited to safety, health, quality, security, the environment, management practices, waste, fraud, abuse, or harassment, intimidation, retaliation, or discrimination occurring because of raising concerns or engaging in protected activities. All personnel have a right and responsibility to openly and freely express work-related concerns.

Personnel are encouraged to first report concerns to their supervisor/line management at the lowest level possible, which is typically the most effective way to resolve issues. However, if issues or problems cannot be resolved between the individual and supervisor/line management, or if the individual prefers to address concerns through anonymity and confidentiality, they may contact the ECP. Personnel are encouraged but not required to report concerns internally. To initiate an internal concern, verbally or in writing, to the ECP:

- Call the UCOR ECP Hotline: (865) 241-0931 or toll free (888) 584-8329; call the ECP Manager (865) 574-8463
- Email [Sandra.Dalton@ettp.doe.gov](mailto:Sandra.Dalton@ettp.doe.gov) or anonymously to [ECPHotline@ettp.doe.gov](mailto:ECPHotline@ettp.doe.gov), or send to the ECP secure fax number (865) 574-7762;
- Mail a written concern to K-1007, MS-7007, Room 1100, by completing Form-190 located on the UCOR intranet under the UCOR Documents “Forms” banner;
- Visit the ECP Manager in K-1007, Room 1100; or call the UCOR’s Ethics Helpline at (865) 241-0933 or (888) 584-8328, or fax to (865) 241-9156.
- To initiate a concern externally, contact: DOE Oak Ridge Office Employee Concerns Program Manager’s Hotline: (800) 676-3267 or (865) 241-3267; or the DOE Office of the Inspector General: (800) 541-1625.

***PROHIBITED ITEMS***

The following articles are prohibited on DOE property:

- Explosives
- Dangerous weapons
- Instruments or material likely to produce substantial injury to persons or damage to persons or property.
- Controlled substances (e.g., illegal drugs and associated paraphernalia but not prescription medicine)
- Other items prohibited by law.

Controlled articles such as portable electronic devices, both government and personally owned, capable of recording information or transmitting data articles (radio frequency, infrared and/or data link electronic equipment) are not permitted in Limited Areas (LAs), Protected Areas (PAs) and Material Access Areas (MAAs) without approval by Physical Security.

Examples of controlled articles are:

- Cell phones
- Cameras and associated storage media
- MP3 players
- E-readers
- Laptops
- Devices with Blue Tooth capabilities such as fitness trackers, watches, headsets, etc.

**UCOR TOBACCO POLICY**

UCOR prohibits smoking of any kind, including e-cigarettes, personal vaporizers, electronic nicotine delivery systems, or any other type of smoking material in any DOE facility or government furnished vehicle managed by UCOR or UCOR subcontractors.

- Smoking should only take place in designated smoking areas.
- Avoid smoking in entranceways, and areas where large groups of people gather.
- Areas that could vent into buildings or vehicles.

Cigarette waste should be thrown away into the proper receptacles.



## **ACCIDENT PREVENTION**

The Safety and Health (S&H) practices described in this handbook have been developed in keeping with UCOR's commitment to prevent accidents and injuries. Effective implementation of, and consistent compliance with, the safe work practices and information provided in applicable procedures are critical to the protection and well-being of all employees, including our customers, vendors, and the public. Accordingly, it is your responsibility to read and fully observe applicable S&H work practices.



### ***Basic Safety and Health Practices***

All work performed by UCOR is evaluated for safety hazards. The evaluations are performed through the Job Specific Hazard Analysis (JHA) process and other reviews by subject matter experts. Pre-job briefing like Pre-Evolution Briefings and STARRT Card briefings identify the hazards and how to safely accomplish the work prior to the start of the work.

- Prior to beginning your work task, a pre-job briefing will be conducted. Actively participate in the briefing and provide input to ensure the task can be performed safely.
- Know how to do your job safely.
- Be alert to changing conditions and stop work as necessary.
- If your activity may endanger co-workers, bystanders, or nearby equipment or materials, take the necessary steps to reduce/eliminate the risk. Stop work if necessary.



- Follow the applicable S&H policies, procedures, and work documents as well as posted signs.
- Understand and follow the manufacturer's instructions/guidelines and/or company procedures before using a piece of equipment.
- Make sure there is sufficient lighting in the work area.
- Wear personal protective equipment (PPE) when and where required.
- Keep work areas clean and orderly. Continually check them for hazards.
- Pay close attention during job training sessions.
- Report all unsafe conditions, acts, and near miss incidents to your supervisor.
- Report all occupational injuries or illnesses immediately to your supervisor and UCOR Health Services.
- Be aware of your surroundings.
- Use proper fall protection equipment and 100% tie-off when working at unprotected elevated positions.
- Become familiar with and understand the project and your company's emergency procedures.
- Use proper manual lifting techniques and/or mechanical assistance to prevent injury.
- Do not leave materials, scraps, or tools where they may be hazardous to others. Keep your work area clean.
- Obey all warning signs and tags (such as "Radiation Area, Contamination Area, Construction Area," "Eye Protection Required," "Authorized Personnel Only," etc.).
- Wear high visibility/reflective safety apparel when walking or working around heavy equipment or near roadways and whenever the JHA specifically requires.
- Horseplay is strictly prohibited.

## **Pre-Task Planning**



Pre-task planning is required for fieldwork performed at UCOR. The purpose of pre-task planning is to identify hazards and to develop controls to eliminate or reduce those hazards so that work can be performed safely.

Your involvement, as an employee, in the pre-task planning is essential to ensure work is done safely.

The tools used by UCOR to ensure effective implementation of the hazard assessment process include the JHA, Safety Task Analysis & Risk Reduction Talk (STARRT), Plan of the Day (POD), and the Pre-Evolution Briefing Checklist. Be sure you have a pre-task plan in place before you begin work.

## **ACCIDENT PREVENTION SIGNS, BARRICADES, AND OTHER POSTINGS**

UCOR procedure PROC-EH-1013, Accident Prevention Signs, Barricades, and Other Postings, provides information and direction to UCOR and subcontractors (at all tiers) on the use of barricades, placards, signage, or other postings to:

- Isolate areas where safety hazards may exist;
- Control employee access to barricaded areas;
- Alert employees to potential hazards and prompt the use of required controls; and
- Deter unsafe work practices.

PROC-EH-1013 does **NOT** cover:

- Controls required for floor and wall openings and roof edges (requiring protective barricades);
- Posting instructions for Rad or fissile areas/materials;
- Unique postings/control requirements for asbestos, lead, etc. that exist in other program documents.

## **EMERGENCY AND EVACUATION PROCEDURES**

Being prepared for an emergency can mean the difference between life and death. Understand your part in responding to an emergency. Employees are our most valuable resource. Alarm types, emergency reporting protocol and phone numbers are located on P. 79.

### ***Planning for an Emergency***

- Familiarize yourself with your employer's emergency procedures including UCOR-4425, *Building/Facility Emergency Plan, Part 2*.
- Anticipate the potential emergencies for your job site and know how to respond.
- Participate in drills.
- Locate the nearest exit and know how to reach it.
- Identify a plan for emergency rescue.
- Identify and know how to contact the nearest rescue organization.
- Know locations of emergency equipment in your work area (e.g., fire extinguishers, AEDs, fire pull boxes).

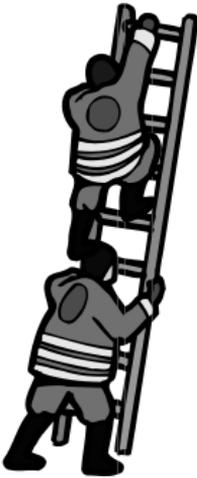
### ***Reporting an Emergency***

When you report an emergency, give the following information:

- The nature of the emergency—fire, medical, police.
- Your name and phone number.
- The location (address) of the emergency.

Answer all questions to the best of your ability and stay by the phone/radio and wait for further instruction. **DO NOT HANG UP.** Be prepared to send a runner to meet the responders.

## Evacuation Procedures



A work area may be evacuated for numerous reasons. Know your evacuation route and safe Assembly Station area.

During an evacuation, remember to keep talking to a minimum. Move quickly to your designated Assembly Station location. Do not run. Follow the directions of trained workers and Building Emergency Wardens (BEWs), and do not return to your work area until instructed to do so by authorized personnel.

### **Accident Scene**

If you are already present or the first to arrive at an accident scene, do not attempt to enter an area if your safety cannot be assured. Do not move the victim unless there is imminent danger and it is necessary to prevent further injury (i.e., fire, explosion, chemical exposure, live wires, and falling objects). Call for help from the appropriate rescue personnel.



Remain calm.

Employees may administer AED and first aid treatment in accordance with their training and confidence level. More information on AEDs can be found in PROC-EP-3028, *Automated External Defibrillators*. Employees who come in contact with blood as a result of a voluntary action should report the incident to the UCOR Health Services for evaluation and appropriate medical treatment.

Reassure the victim that help is on the way.

***Fire and/or Smoke***

When fire or smoke is discovered, sound an alarm. Alert the workers closest to the fire to move to the nearest point of evacuation or to the pre-determined assembly area.



If there is heavy smoke, get down below the level of the smoke, and crawl to the nearest exit or safe assembly area. Always check closed doors for heat before opening. Do not open if the door is hot! Contact the fire department or make sure the fire department has been/is being contacted. Only attempt to fight a fire within your comfort and capability, and only if you have an escape path.

If trained to use a fire extinguisher on small fires, use the “Pull, Aim, Squeeze, and Sweep (PASS)” method depicted in the graphic on the following page.

*The PASS Method for Extinguishing Small Fires*

**Pull**

the extinguisher pin out.



**Aim**

the nozzle at the base of the fire.



**Squeeze**

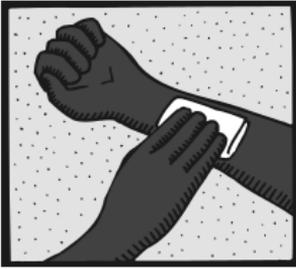
the trigger.



**Sweep**

the nozzle across the base of the flames.



**FIRST AID AND INCIDENT REPORTING**

Per PROC-EH-2001, *Accident/ Incident Reporting*, report all injuries immediately, no matter how minor, to your supervisor and UCOR Health Services. A medical evaluation will be provided, and the incident will be documented. If you experience a work-related injury or illness that was not reported before leaving the work site, you should contact your supervisor as soon as possible. If unable to reach your supervisor, call UCOR Health Services (865-574-8562) or the ETP Park Shift Superintendent (865-574-3282) who will help you obtain any care necessary. You must always return to work through Health Services after being treated by an outside medical provider, such as an Emergency Room or specialist, for a possible work related injury or illness. You are to bring all documentation given to you from that outside medical provider to UCOR Health Services upon return to work.



Subcontractor supervisors must immediately inform the assigned UCOR Subcontract Coordinator of all work-related incidents, including injuries, vehicle accidents, property damage, and near-miss incidents.

Per POL-UCOR-308 *Returning to Work Safely*, prior to returning to work after a non-occupational injury or illness resulting in either hospitalization, outpatient surgery (of any duration) or absence of 40 work hours or more consecutively, you must present a medical clearance (return to work form) from the outside attending physician to UCOR Health Services.

To make reasonable accommodations for the S&H of pregnant employees and their unborn children, women are encouraged to notify their supervisor in writing using Form-

1050 as soon as they become knowledgeable of their pregnancy and then report to UCOR Health Services.

***INCLEMENT WEATHER***

Workers may be exposed to adverse weather conditions such as high wind, extreme heat or cold, severe thunderstorms, and snow/sleet/ice accumulation. Work activities that may be affected by adverse weather conditions shall be evaluated by the Supervisor and Project S&H personnel to determine the impact of the weather on workers.

Outside work shall be stopped for 30 minutes or until an “all clear” announcement when visible lightning is in the area or there is a PSS/LSS or other notification system of lightning in the area (10 mile radius). Buildings should be the primary shelter locations with enclosed vehicles/equipment acceptable if it is of greater hazard to reach a building.

If a tornado is sighted, the PSS/LSS will make an announcement with best available means of communication for workers to cease activities and take shelter in a sturdy building until further notice.

If weather-related conditions develop during the night and warrant a delayed opening or official closing of the site, the PSS will provide information through a recorded message on the ETTP Information Line (865-241-4636 or 865-241-INFO) as soon as possible following any decision to close site operations.

**MEDICATIONS**

Prescription medications shall not be taken on the job unless prescribed by a physician or other authorized Licensed Health Care Provider (LHCP).

In accordance with PROC-HR-0306, *Drug and Alcohol Control*, and POL-HR-306, *Drugs and Alcohol*, certain medical or psychological conditions may require prescription or non-prescription medications that could dull reaction time, impact judgment, cause dizziness or drowsiness or adversely affect your ability to work safely. You must notify your supervisor and the UCOR Site Occupational Medical Director that you are taking such prescription medication(s) or make an appointment to speak with a UCOR Health Services professional. If you are unsure whether a medication should be reported, please contact UCOR Health Services (574-8562).

You do not have to report “over the counter” medications unless you are having side effects that could affect your ability to work safely.

**SUBSTANCE ABUSE**

UCOR strives to maintain a safe and efficient work environment, free from illegal drug and alcohol use. The possession, sale, use, or distribution of prohibited substances or related paraphernalia is strictly prohibited.

Violation of the Drugs and Alcohol policy (POL-HR-306) may result in disciplinary action up to, and including, suspension, retest, and discharge.

PROC-HR-0306 is the UCOR procedure for “Drug and Alcohol Control.” If you suspect a coworker of being under the influence of a prohibited substance, notify your supervisor immediately.

**OFFICE SAFETY**

- Do not run electric, telephone, or office machine cords through walkways or in any area where they could be a tripping hazard or be damaged.
- Do not use chairs or other office equipment in lieu of stepladders to reach elevated areas.
- Lift heavy objects properly by bending at the knees and using leg muscles.
- Use handrails when going up or down stairs.
- Do not tilt back in a straight chair.
- Only qualified electrical workers (QEW) shall repair electrical equipment.
- Do not overload electrical circuits by plugging in too much equipment in outlets. Tripped circuit breakers should only be reset by a QEW after the cause has been determined and it is safe to reenergize the circuit.
- Keep work areas, passageways, and stairways free of debris, equipment, and materials.
- Keep lunch or eating areas clean and free of food scraps, wrappers, cups, and other disposable items.
- Open file drawers one at a time and keep drawers closed when not in use.
- Load file drawers from the bottom up with the heaviest load in the lower drawer.
- Anchor file cabinets and bookshelves as needed to maintain stability.
- Do not remove guards or safety devices from office equipment. If discovered in this condition, do not use. Alert others including your supervisor, and have the equipment tagged out or removed from service.
- Check office furniture regularly for sharp edges, splinters, and loose casters or bolts. Remove from service if unsafe or inoperable.
- Do not adjust or clean power-driven office machines when they are in operation or energized.

- Ensure that all portable heaters, fans, hot plates, and coffee makers are turned off at the end of the work shift.
- Inspect electrical cords for damage and remove them from service if defective.
- Ensure appliances such as portable heaters, hot plates, coffee makers, etc. are plugged directly into a functioning wall outlet. (Do not plug into an extension cord or power strip.)
- Do not “piggy-back” or “daisy-chain” extension cords or power strips. Only a single extension cord or single power strip will be used to connect a device to the power source.

### ***PEDESTRIAN SAFETY***

Workers face multiple hazards while walking to-and-from in parking lots, buildings, and work sites. Following are controls for reducing the potential for incident/injury:

- Keep your eyes on path. Walking is working. Avoid looking at your phone, papers, or co-workers while walking.
- Hold the handrail when ascending and descending stairs and ramps.
- Watch for damage, debris, and spills on your path of travel. If you see something, say something.
- Wear reflective clothing when walking/working in areas where heavy equipment, forklifts, or vehicles are present and if walking in roadways. Avoid these areas as a pedestrian if possible.
- Stay within designated walkways and crosswalks. If on the side of a road, walk facing oncoming traffic.
- Do not allow your line-of-site to be impaired by what you are carrying. Use assistance such as a lift or a cart.
- If driving, obey posted speed limits, provide right-of-way to personnel in designated crosswalks, and park only in designated parking spaces.
- Apply ice-melt/sand on icy or slick work areas or paths of travel.

## **INDUSTRIAL HYGIENE**

### ***Hazards and Control***

Where the potential exists for exposure to hazardous substances (physical, chemical, or ergonomic), your employer will evaluate your work area and may implement industrial hygiene exposure monitoring and controls.

### ***Physical Agents***

These include excessive levels of noise, temperature extremes, non-ionizing radiation, vibration, etc. Personnel who potentially come in contact with physical agents shall be provided with adequate training, shielding, or protection depending on the hazard involved.

### ***Chemical Agents***

These arise from potential airborne emissions or release of mists, vapors, gases, or solids in the form of dusts or fumes. Each of these agents can enter the worker's body through one or more routes of entry. The primary routes of entry are: inhalation, ingestion, injection, and absorption. If you believe you have received an exposure through any route of entry, notify your supervisor immediately and seek evaluation from UCOR Health Services.

### ***Ergonomic Hazards***

These include improperly designed tools, work areas, or work procedures; improper lifting or reaching; poor visual conditions; or repeated motions in an awkward position that could result in injury. Vibration is a physical hazard that can create or worsen ergonomic injury. Some tools and tasks at UCOR require additional controls because they involve worker exposure to high vibration. Engineering and good design principles must be applied to eliminate these hazards. Selection of the proper tool is also critical to eliminate this hazard. Contact your project Industrial Hygiene (IH) Lead for assistance.

## **HAZARD COMMUNICATION**

Employees are required to be trained on and follow UCOR's hazard communication program, which includes the requirements of the Globally Harmonized System (GHS). If you have any questions regarding hazardous materials, contact your supervisor or your Project IH.

Even common materials such as concrete products, paint, solvents, compressed gases, and lubricants can be potential "hazardous substances." To be protected from hazardous substances at the job site, you must understand and follow the written Hazard Communication Program. Follow storage, use, and disposal instructions on the product label, MSDS/SDS, and/or specific project guidance.

### ***Training***

You must be trained by your employer on the Hazard Communication Program and the MSDS/SDS of the specific chemicals used in your work scope.

### ***Container Labeling***

Primary containers of hazardous materials shall contain the following information on the label: (1) the name of the material, (2) a pictogram conveying the hazards of the chemical, (3) a signal word such as "Danger" or "Warning", (4) a hazard statement to describe the class and category of the hazard, (5) a precautionary statement of what to do to minimize or prevent adverse effects of exposure or improper storage/handling, and (6) contact information (name, address, and telephone number) of the chemical manufacturer or responsible party.



Approved secondary containers (that a material has been transferred into from its original packaging) should be labeled with at least the following information: (1) the name of the material, (2) an appropriate hazard warning (ex.

Flammable) including target organ effects (ex. causes lung damage).

All personnel should read labels to become familiar with the products being used. Never use unlabeled substances! Report them to your supervisor immediately.

### **GHS Pictogram Chart**

The appropriate pictograms should be found on the primary container label of hazardous chemicals in the workplace.

<p><b>Health Hazard</b></p>  <ul style="list-style-type: none"> <li>• Carcinogen</li> <li>• Mutagenicity</li> <li>• Reproductive Toxicity</li> <li>• Respiratory Sensitizer</li> <li>• Target Organ Toxicity</li> <li>• Aspiration Toxicity</li> </ul>	<p><b>Flame</b></p>  <ul style="list-style-type: none"> <li>• Flammables</li> <li>• Pyrophorics</li> <li>• Self-Heating</li> <li>• Emits Flammable Gas</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>	<p><b>Exclamation Mark</b></p>  <ul style="list-style-type: none"> <li>• Irritant (skin and eye)</li> <li>• Skin Sensitizer</li> <li>• Acute Toxicity (harmful)</li> <li>• Narcotic Effects</li> <li>• Respiratory Tract Irritant</li> <li>• Hazardous to Ozone Layer (Non Mandatory)</li> </ul>
<p><b>Gas Cylinder</b></p>  <ul style="list-style-type: none"> <li>• Gases under Pressure</li> </ul>	<p><b>Corrosion</b></p>  <ul style="list-style-type: none"> <li>• Skin Corrosion/ burns</li> <li>• Eye Damage</li> <li>• Corrosive to Metals</li> </ul>	<p><b>Exploding Bomb</b></p>  <ul style="list-style-type: none"> <li>• Explosives</li> <li>• Self-Reactives</li> <li>• Organic Peroxides</li> </ul>
<p><b>Flame over Circle</b></p>  <ul style="list-style-type: none"> <li>• Oxidizers</li> </ul>	<p><b>Environment *(Non Mandatory)</b></p>  <ul style="list-style-type: none"> <li>• Aquatic Toxicity</li> </ul>	<p><b>Skull and Crossbones</b></p>  <ul style="list-style-type: none"> <li>• Acute Toxicity (fatal or toxic)</li> </ul>

Hazardous chemicals may have additional legacy labeling information such as NFPA (National Fire Protection Association) (see below) or HMIS (Hazardous Material Information System) graphics. Be aware of the differences in numbering between those and the GHS system of numbering.

## NFWA "Fire Diamond"

**Health Hazard  
Blue Diamond**

- 4-Deadly
- 3-Extreme Danger
- 2-Hazardous
- 1-Slightly Hazardous
- 0-Normal Material

**Fire Hazard  
Red Diamond**

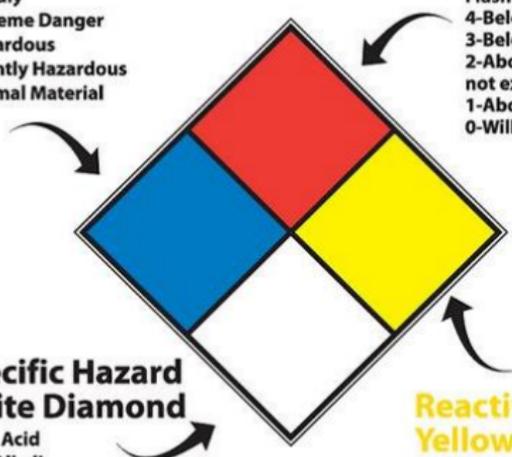
- Flash Points
- 4-Below 73°F
  - 3-Below 100°F
  - 2-Above 100°F not exceeding 200°F
  - 1-Above 200°F
  - 0-Will not burn

**Specific Hazard  
White Diamond**

- ACID - Acid
- ALK - Alkali
- COR - Corrosive
- OXY - Oxidizer
- ☢ - Radioactive
- ☒ - Use No Water

**Reactivity  
Yellow Diamond**

- 4-May Detonate
- 3-Shock & Heat may detonate
- 2-Violent Chemical change
- 1-Unstable if heated
- 0-Stable



For work activities involving the use of hazardous materials, the appropriate PPE such as gloves, goggles, aprons, chemical-resistant clothing, and/or respirators shall be worn as specified in the job JHA, STARRT card, or as directed by the Project IH. Contact with hazardous materials shall be avoided.

Hazardous and/or toxic materials such as solvents, coatings, or thinners shall be stored in approved containers. Original shipping containers that satisfy local safety regulations are considered approved containers for transporting and storing these materials. Hazardous or toxic materials shall be returned to the appropriate designated storage areas at the end of each shift. Flammable chemicals must be stored in flammable storage cabinets when not in use.

## Chemical Spills



All chemical spills shall be contained and cleaned up immediately to prevent further contamination. Generally, sweeping, vacuuming, mopping, or use of absorbent materials is recommended for clean-up operations. Chemicals identified as hazardous by federal and state agencies require special handling procedures. Ensure proper PPE is selected and utilized during spill response. (Response PPE may differ from product usage PPE.)

Use **SWIMS** for a general response guideline:

**S**top and or secure the operation causing the spill.

**W**arn others in the immediate area.

**I**solate the spill and back away a minimum of 10ft.

**M**inimize individual exposure.

**S**eek assistance from Supervision, Project Environmental Compliance & Protection (EC&P) Lead, PSS, FM, etc.

### **Material Safety Data Sheets/ Safety Data Sheets**

Your employer has Material Safety Data Sheets (MSDS) or Safety Data Sheets (SDS) for hazardous materials on the job site. They contain information about the hazardous properties of materials, and measures you should take to protect yourself. These documents are stored on the Hazardous Materials Management Information System (HMMIS) SDS Library found on the UCOR intranet under Material Safety Data Sheets. MSDS/SDS's can also be requested from your supervisor.

**NOTICE**  
SAFETY DATA SHEETS  
ARE AVAILABLE  
UPON REQUEST

## CONFINED SPACES

Confined spaces include, but are not limited to, water towers, storage tanks, process vessels, bins, boilers, ducts, sewers, utility vaults, sumps, and some trenches.



What all of these spaces have in common is that they are large enough for a person to enter, have limited means of entry and exit, are not designed for people to work in. In addition, some can contain some form of hazard. Hazards that can be present in these spaces are: lack of oxygen, flammable or toxic gases, electrical, fall potential, engulfment, and mechanical hazards.

Always ensure a planned confined space entry has been properly evaluated by an IH per PROC-IH-5138, *Confined Space Entry*. A properly completed confined space entry permit will assure that all conditions have been met for safe entry, and that a rescue plan has been established. Permits must be posted near the entrance, and must be signed by the Issuing Entry Supervisor.

You must **NEVER** enter a confined space without authorization from your employer. **Only people who have completed confined space training and have been medically approved shall enter a confined space.** Prior to entry, Project IH representatives will evaluate the space for atmospheric, physical, and other hazards. If hazards are present, it may be necessary to ventilate the space and/or use air-supplied respirators.



All sources of hazardous energy must be locked out.

**Never enter a confined space to attempt to rescue someone.** Rescue Services personnel are specially trained to provide confined space rescue as needed.

## RESPIRATORY PROTECTION

Your employer is responsible for implementing a respiratory protection program through PPD-IH-5151 *Respiratory Protection Program*. When hazardous or toxic materials are present in your work area, efforts shall be made first to use engineering controls and area ventilation to reduce airborne concentrations of these materials. Where airborne concentrations cannot be reduced below acceptable limits, your employer is required to conduct an evaluation to determine the appropriate method of respiratory protection.

Ensure that you understand and observe the entire respiratory protection program requirements. The basic program includes (but is not limited to):



- Knowing why the respirator is necessary and how improper fit, usage, or storage can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;
- Cartridge change schedules and End-of-Service-Life-Indicators (ESLI);
- What to do if a respirator malfunctions while in use;
- How to inspect, don and doff, use, and check the respirator and respirator seals.
- Requirements for maintenance and storage of respirators;
- How to recognize medical signs and symptoms that may limit or prevent use of respirators.

**Each employee wearing a respirator must be medically qualified, fit tested, and trained in the use and limitations of the respiratory protection selected.**

Report any changes in your health and/or physical facial characteristics that may affect your ability to wear

respiratory protection to the UCOR or other LHCP providing medical surveillance.

Plant or process air shall not be used to supply any breathing apparatus, unless provisions have been made to ensure this air source meets established requirements for safe use as breathing air (Grade D).

### **HEARING CONSERVATION**

Hearing protection is required for individuals working in a posted noise area. Hearing protection may also be required where excessive noise exposure exists on a temporary basis. This could include situations where equipment such as jackhammers, saws, drills, grinders, or heavy equipment is being utilized. All personnel shall observe the following:

- Your employer shall post areas where noise levels exceed established limits, even on a temporary basis, and shall provide you with adequate hearing protection. This protection may include muffs, plugs, or a combination thereof. (NOTE: when used in combination, muffs only add a 5 NRR (Noise Reduction Rating) to the protection factor of the plugs.)



- Employees required to wear such hearing protection shall be trained regarding the company's Hearing Conservation Program and on the proper use of such equipment.**

- Always wear your hearing protection in designated areas or when performing designated work tasks. Hearing protection will be utilized when there is a potential employee exposure above the 8-hour TWA level

of 85dBA or an equivalent noise dose as presented in the chart below:

- Our work mission often results in frequent changes in work environment. If you cannot conduct a normal conversation with a co-worker who is at arm's length from you without raising your voice, the noise level suggests you may need to utilize hearing protection. Contact your Project IH for guidance.

<b>ACGIH Noise Exposure Threshold Limit Values</b>		
<b>Sound Level dBA</b>	<b>Duration per Day</b>	<b>Time</b>
82	16	Hours
85	8	
88	4	
91	2	
94	1	
97	30	Minutes
100	15	
103	7.5	
106	3.75	
109	1.88	
112	0.94	
115	28.12	Seconds
118	14.06	
121	7.03	

**TEMPERATURE EXTREMES**

PROC-IH-5134, *Temperature Extremes* provides information on planning and work controls related to both heat and cold extreme temperatures that UCOR workers face throughout the year. Each field project shall develop a HIPP (Heat Illness Prevention Plan) for specific controls. The following are general temperature extreme controls:

- Ambient temperatures above 80°F- Project IH shall evaluate conditions and provide control recommendations.
- Wet Bulb Globe Temperatures (WBGT) above 90°F- temporary suspension of physical activity may be imposed by the Project IH pending further evaluation,
- Use of totally encapsulating PPE for specific hazards- Physiological monitoring will be conducted in addition to any existing control sets.
- Prolonged work being performed at equivalent chill temperature at or below 39°F- Project IH shall evaluate for additional total body protection.

The above situations are indicators that require further coordination with supervision and Project Industrial Hygiene in order to establish a control strategy that will prevent heat stress injuries.

Report any personal or coworker symptoms of heat or cold related illness to your supervisor, S&H, or UCOR Health Services immediately.

## **ASBESTOS HANDLING/REMOVAL**

Construction activities that may disturb asbestos-containing materials (ACM) must be evaluated prior to starting work. These materials must be identified and evaluated by a competent person prior to disturbance. Suspect ACM may include pipe insulation, roofing, fireproofing, plaster, transite, floor tile, ceiling tile, mastics, etc.

All personnel involved with handling, removal, demolition, and/or disposal of ACM shall comply with PROC-IH-5177, *Asbestos and Other Fibrous Materials*, Occupational Safety and Health Administration (OSHA), U. S. Environmental Protection Agency (EPA), and State of Tennessee and other local standards governing this activity.



The Federal OSHA Asbestos Standard requires that personnel working with asbestos be properly trained, monitored for potential exposure, medically evaluated, and that engineering controls and PPE be utilized to prevent exposures in excess of established limits.

EPA asbestos requirements, which include written notification prior to removal, utilization of emission controls, and special handling and disposal procedures, shall be followed.

**Only personnel trained and authorized by your employer shall be assigned to activities that potentially disturb asbestos.**

If you observe an uncontrolled suspect ACM then back away and notify your supervisor and Project IH.

## ***BIOLOGICAL HAZARD PROTECTION***

Workers have potential exposure to biological hazards in the course of their work and in some cases during basic movement around the site.

### ***Stinging and Biting Insects***

Office and field workers are potentially exposed to stinging and biting insects such as wasps, hornets, yellow jackets, fire ants, ticks, and venomous spiders.

- Consider notifying your supervisor or co-worker if you have known allergic reactions to bites/stings.
- Be on constant lookout for common habitat and avoid if possible.
- Notify the Building/Facility Manager to have any observed nests treated.
- Bites or stings must be reported immediately and evaluated by UCOR Health Services.
- Inspect clothing and skin carefully after being in a likely exposure environment.
- Use protective clothing and repellents when appropriate.

### ***Snakes and Rodents***

If nuisance wildlife is interfering with operations or has entered into a building, please contact your EC&P Lead to arrange for TWRA (Tennessee Wildlife Resources Agency) personnel to remove the wildlife. Contact or bites from nuisance wildlife must be reported immediately and evaluated by UCOR Health Services.

### ***Plants***

The primary plant hazards on site are from poison ivy, oak, and sumac. The Urushiol oil released from the plant begins to penetrate the skin within 10 minutes of contact and may have a delayed reaction. The oil can be transferred to the skin by an intermediate object such as a tool or glove/clothing that came in contact with the plant. Avoid

skin contact with these objects until washed with an emulsifying soap/detergent. Clean/wash the affected area of skin immediately after exposure, report the exposure to supervision, and seek medical evaluation from UCOR Health Services.

### ***WORKING OVER OR NEAR WATER***

For employees that are working over or near water, a determination of the danger of drowning requires the evaluation of such factors as water type (pool, river, canal, etc.) and depth, presence or absence of a current, work height above or away from the water surface, the use/non-use of fall protection for work over water, and the need for a lifesaving skiff and ring buoys to ensure prompt rescue. Contact the project S&H Representative for the appropriate control set when working over or near water.

When a flotation device is determined to be required, workers will be provided with a U.S Coast Guard approved life jacket or buoyant work vest. Individuals are responsible for inspecting the jacket or vest prior to and after each use for defects, which would alter strength or buoyancy. Defective units shall be removed from service.

### ***RADIOLOGICAL PROTECTION***

UCOR has adopted an aggressive approach to minimizing worker exposures to ionizing radiation through an As Low As Reasonably Achievable (ALARA) Program. The UCOR ALARA Program follows a graded approach through the application of ALARA Plans, Pre-job ALARA Reviews, workplace monitoring, work-site inspections, and ALARA performance indicators. All employees are expected to:

- Observe posted, written, and oral radiological safety instructions and procedures, including instructions on the applicable Radiological Work Permit.
- Keep clear of all radiological areas unless authorized. These areas will be barricaded and/or posted.
- Do not enter radiological-posted areas unless you have received the appropriate training.

**COMPETENT PERSON**

A “Competent Person” is one who has the experience and knowledge needed to identify existing and predictable hazards, and has the authority to take immediate corrective action to eliminate them.

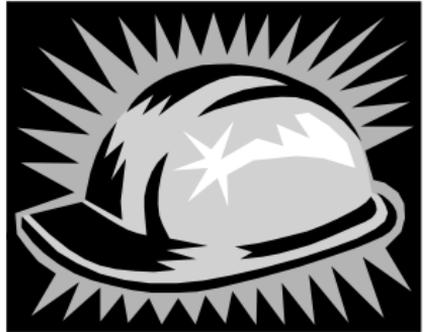
Your employer will designate a Competent Person where the activity or task requires one. Here are some examples of jobs or areas that require a Competent Person:

- Excavation and trenching work
- Ladder inspection (quarterly)
- Asbestos abatement
- Lead abatement
- Scaffolding
- Fall Protection
- Hoisting and Rigging Equipment Inspection
- Confined Space Evaluation



## **PERSONAL PROTECTIVE EQUIPMENT**

Hazards should always be controlled by elimination, substitution, engineering controls, work practices, and/or administrative controls prior to adopting the use of PPE. The proper selection and use of PPE is an important element in preventing work-related



injuries. PPE will provide you a level of protection against injury and illness only when maintained and used correctly. You should be aware of and follow all the PPE requirements identified in PROC-EH-2005, *Personal Protective Equipment*, on the JHA or other applicable work control documentation (permits, procedures, etc.), and observe postings at all times. When PPE is specified for certain work assignments or locations, its use is mandatory.

You must also wear specified clothing suitable for the work you are performing. Check with your supervisor for specific requirements for your work area.

### **Head Protection**

All employees, visitors, and vendors shall wear a hard hat in designated/posted areas. Alterations shall not be made to the hat or its suspension. Hard hats or suspensions shall be replaced when they are broken or cracked.

The hard hat must be specifically suited to the type of hazards present in the work area, such as falling or flying objects, impact hazards, electrical shock, and/or burn hazards. The headband must be adjusted to fit snugly. The bill of the hat shall be worn in the front to protect the eyes from small debris and particles that may fall onto the hat.

### ***Hard Hat Care and Inspection***

Always store your hard hat in a clean, dry area.

Never use paint, solvents, hydrocarbon-type cleaners, glue, or pens on a hardhat. **These substances can cause serious damage that may not be visible upon inspection.**

On a daily basis, visually inspect the shell and suspension of your hard hat for breakage, cracks, craze (spider-webbing) pattern, discoloration, chalky appearance, or any other unusual condition. Also, inspect the shell for brittleness by flexing the brim. Any of these conditions indicates a loss of protection from impact and electrical conductivity. The equipment **MUST** be replaced immediately.

### ***Eye and Face Protection***

In the workplace, some of the most common injuries are those to the eye and face, resulting from flying particles, molten metal, chemicals, gases, or radiant energy. Selecting and using proper eye and face protection can prevent most of these injuries.

Where eye protection is required, workers who wear corrective lenses must either wear prescription safety glasses with side-shields or safety glasses with side-shields that fit over their corrective lenses. Ordinary prescription glasses, unless made of safety glass mounted in safety frames, DO NOT provide adequate protection from eye hazards encountered in the workplace. Ordinary lenses can shatter, showering debris in the user's eye, and ordinary frames are not strong enough to protect against impacts.

Inspect eye protection daily for breakage, cracks, craze (spider-webbing) pattern around the nosepiece, scratches, discoloration, missing nosepiece, or any other unusual condition. If damage is observed, remove from service until repaired or replaced.

## ***Selection and Use of Eye and Face Protection***

A minimum of **safety glasses with side shields** is required in all construction areas of the project. Whenever there are potential eye hazards, such as flying or falling objects, excessive airborne dust, chemicals splash, concrete chipping, metal grinding, or harmful rays, additional appropriate eye protection must be worn. Some areas of the project may require you to upgrade your eye protection according to the hazards. Check with your supervisor or task specific JHA for help in determining the eye protection you may need.



### ***Safety Goggles***

Safety goggles should fit tight to the face, surrounding the eye area to provide extra protection from splashes, impacts, and sparks. They must be worn as required by Industrial Hygiene when handling chemicals such as acids and bases, irritating fumes and mists, cryogenics, corrosive gases, and when there are severe hazards from flying particles.

### ***Face Shields***

Face shields are worn when maximum protection is needed for the face and neck from flying particles and chemical splashes. Face shields are **NOT** intended to provide full eye protection. When full-face protection is needed, approved safety glasses with side shields or goggles are also required under a face shield.

### **Hand Protection**

Gloves are made from various materials, each providing protection from a specific type of hazard. For example, canvas and leather gloves offer some protection from sharp or abrasive objects. Rubber, latex, neoprene, and nitrile gloves offer protection from specific chemicals. **No single glove offers protection from all hazards.** Your supervisor or Safety Representative can assist in selecting the right glove for the work task.



### **Hand Protection**

<b>Hazard</b>	<b>Type of glove</b>
Light duty (moving boxes, etc.)	Cotton or leather
Medium duty (wood, concrete, pipe, small pieces of rough glass, etc.)	Leather or Kevlar
Heavy duty (exposure to sharp or jagged metal, glass, box cutters, etc.)	Kevlar
High temperature	Insulating gloves
Low temperature	Insulating gloves
Electrical	Consult your supervisor and/or Safety Representative
Chemical	Consult your supervisor and Project IH

**Note:** Gloves alone will not prevent injuries. You must maintain a close eye on where you place your hands.

**Keep your hands out of pinch-points and out of the line-of-fire.**

### ***Foot Protection***

Protective footwear offers you protection from falling objects, punctures, crushing, slipping, and electrical shock and is described in PROC-EH-2000, *General Safety Requirements*.



Safety toe shoes/boots or sturdy leather work shoes/boots (dependent on the JHA or other work control documentation) are required in construction areas. Rubber boots limit exposure to chemicals and provide improved traction on slippery surfaces. When you purchase safety footwear, be sure that they have the ASTM F2413 label.

Boots should be inspected daily for deterioration, sole condition, and deterioration of the laces. Boots with worn out tread need to be replaced or resoled.

## **FALL PREVENTION AND PROTECTION**

UCOR's policy on fall protection PROC-EH-2006 *Fall Prevention and Protection* states all persons, including subcontractors, shall adhere to a program that provides 100% fall protection. This requires you to be protected from falls or tied off 100% of the time when you are working at or above 6 ft in construction environments and at or above 4 ft when performing operations and activities captured within the general industry standard.

The Hierarchy of Fall Prevention/Protection is to make every attempt to use primary systems before using secondary systems.

- Primary – guard rail systems to include scaffolding and platforms, hard barriers, covers, etc.
- Secondary – restraint, positioning device, arrest, and nets
  - Fall Restraint – prevents employee from reaching fall point and anchor point must be a minimum of 1,000 pounds or twice the potential force
  - Fall Positioning – for vertical work activities such as rebar and requires a secondary fall arrest system
  - Fall Arrest – must have adequate fall clearance and anchor point must be capable of supporting 5,000 pounds or two times the maximum arresting force if certified by a Qualified Person

**Before using secondary fall protection equipment, you must have received training on how to properly use and maintain your fall protection and fall arrest systems and equipment, how to determine safe anchorage points, and how to establish a rescue plan.**

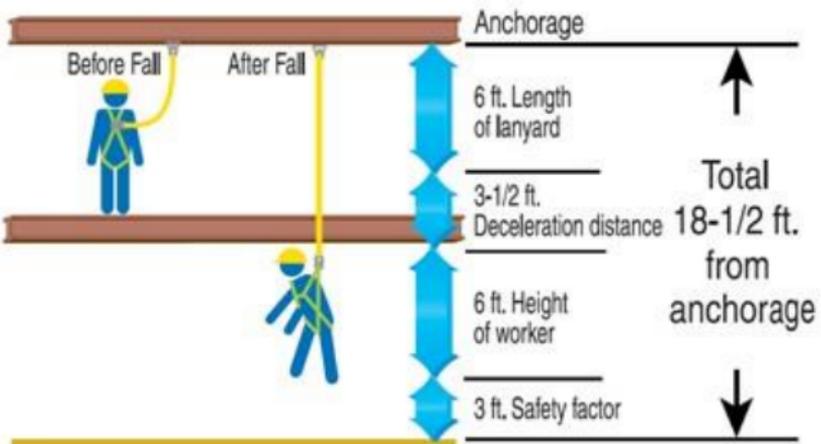
- Secondary fall protection equipment requires a Competent Person inspection not to exceed one year or more frequently upon



manufacturer requirement.

- You are required to carefully inspect all fall protection equipment before each use. If you find any damaged or worn components, **DO NOT** use the equipment. Return it to your supervisor immediately.
- Always make sure the locking mechanism on your snap hook is functioning properly. Never connect two snap hooks together or double your lanyard back on itself unless designed to do so.
- **NEVER** use a conduit or ceiling grid as an anchor point.
- Always check for proper fit of your harness. It should fit snugly with the flat side of the D-ring positioned between your shoulder blades. Remember, force from a fall will stretch your harness, so be sure it fits snugly.
- Shock-absorbing lanyards are designed to stretch up to 3.5 ft before stopping your fall. In addition, if your anchor point is located below your D-ring, this will add to your total fall distance. It is always preferable to anchor to a point **ABOVE** your D-ring.
- Equipment dedicated for fall protection must not have been used for any other activities such as material hoisting and rigging activities.

## Calculating Your Potential Fall Distance

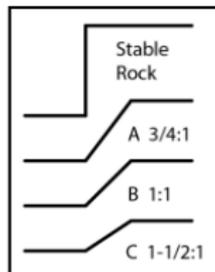


## EXCAVATIONS AND TRENCHING

All excavation and trenching operations shall conform to established governmental standards:

- Obtain a permit when required by PROC-FO-1004 *Excavation/Penetration*.
- Identification of underground structures and utilities are identified through the Tennessee One Call (811) service, UCOR utility location services and reviews of the historical site drawings.
- Atmospheric testing shall be performed if there is a potential for hazardous atmosphere to occur. Contact your Project IH.
- Depths 4 ft or greater must have a safe means of access/egress placed as close to the worker as possible not to exceed a distance of 25 ft.
- Depths 5 ft or greater shall be evaluated by a competent person and shored or sloped /benched back to a safe angle of repose.
- Excavations shall be sloped to an angle no steeper than 1 ½ horizontal to 1 vertical if soil classification is not determined.
- When soil classification is established, the following sloping configurations may be utilized.

Soil/Rock Type	Max Allowable Slope: (H:V)
Stable Rock	Vertical (90°)
Type A	¾:1 (53°)
Type B	1:1 (45°)
Type C	1 ½:1 (34°)



- Materials shall be placed a minimum of 2 ft away from the edge of the excavation. Precautions must be taken to prevent such materials from falling into the excavation.

- A Competent Person shall document inspection of excavations daily prior to employees entering and after each rain, snow, freeze, etc. or significant change related to work activities. If evidence of cave-ins or slides is apparent, all work in the excavation must cease until necessary precautions have been taken to safeguard employees.



- Where vehicles or equipment operate near excavations or trenches, the sides of the excavation must be shored or braced, as necessary, to withstand the force exerted by the superimposed load. In addition, stop logs and other substantial barricades must be installed at the edges of such excavations.

- Materials used for sheeting, shoring, or bracing shall be in good condition. Timbers must be sound, free of large or loose knots, and of adequate dimensions.



- Walkways, bridges, or ramps with standard guardrails shall be provided where employees or equipment are permitted or required to cross over excavations or trenches 6ft deep or greater.

## SCAFFOLDING

Scaffolds or work platforms shall only be erected, moved, dismantled, or altered by trained scaffold erectors under supervision and direction of a Competent Person.



- Scaffold erectors will utilize fall protection during erection or dismantling activities when working at elevations greater than 10 feet and the use of such protection does not create a greater hazard.
- Install barricades to control access when scaffolds are being erected or disassembled.
- A Competent Person shall document inspection of scaffolds before each work shift on the scaffold tag. A red scaffold tag shall remain in place on a scaffold that is under construction until a Competent Person inspects and applies either a yellow or green scaffold tag.
- **Scaffold user training is required prior to using a scaffold.**
- Guardrails, midrails, and toe boards shall be installed on all open sides of scaffolds.
- All scaffolds should be fully planked with scaffold planks, cleated, or secured with boards extending over the end supports by at least 6 in. but not more than 12 in.
- All scaffold components shall be visually inspected before each use.
- Access ladders shall be provided for each scaffold. Climbing the end frames is prohibited unless their design incorporates an approved ladder.
- Barrels, boxes, kegs, and similar unstable objects shall not be used as work platforms or to support scaffolds.
- Maintain a minimum 10ft clearance from exposed energized lines and equipment.
- Ensure tools, materials, and debris does not accumulate on scaffolds in a manner that creates a falling object or tripping hazard.

## ***PORTABLE LADDERS***

Ladder safety begins with the selection of the proper ladder for the job and includes inspection, setup, proper climbing, use, care, and storage.

Ladder training is required prior to using a portable ladder.



### ***General Safety Rules for All Ladders***

Your supervisor should provide several types of ladders for your use. Using a makeshift means of access is prohibited!

#### ***Ladder Selection***

- Work from a portable ladder will be the exception when no other method is feasible. Feasibility should be driven by assessing total risk and not based on ease or convenience.
- Manufactured ladders must be rated a minimum ANSI Type 1A with 300-pound capacity (class 1A). Ensure the combined weight of user and equipment does not exceed the rated capacity.
- Select a ladder that will put you at the appropriate working height without overreaching or standing on the top step or cap of a stepladder or the top 3 rungs of a straight/extension ladder.
- Non-conductive fiberglass ladders shall be used in situations where the employee, tools, or the ladder could contact exposed energized parts.

**Note:** Platform ladders made of metal may be used per restrictions listed in PROC-FO-1015 *Scaffolds and Portable Ladders*.

### ***Ladder Inspection***

Always inspect a ladder prior to use per guidance in the procedure. Ensure the load rating is visible and the ladder is within the quarterly inspection date on the sticker/tag.

*Never use a damaged ladder. Tag it out and report it to your supervisor, and remove it from service.*

Ladders shall be inspected and tagged quarterly by a Competent Person.

### ***Ladder Setup***

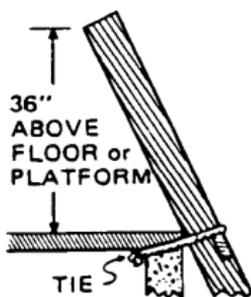
Portable ladders in use shall be tied, blocked, held, or otherwise secured to prevent displacement. Prior to setting up a ladder, survey the area overhead for electrical wires and other impediments. Set up the ladder in a 4 to 1 (vertical to horizontal) ratio. Place ladder feet firmly and evenly on the ground or floor. Make sure the ladder is straight and secure before climbing it. The top should rest evenly against a flat, firm surface. Do not allow ladders to lean sideways.

Be aware of and protect against an increased fall hazard if using ladders in close proximity to edges or guardrails. Additional guardrails or fall protection may be required.

### ***Ladder Use***

- Employees shall face the ladder when ascending or descending and maintain three points of contact.
- Keep the steps and rungs clean. Also, clean your shoes before climbing a ladder.
- Do not hand carry tools or materials while ascending or descending a ladder. Use a tool belt or rope to raise/lower tools/equipment.
- Always move the ladder to avoid overreaching.

- Ensure that the side rails of ladders will extend 36-inches above the landing when being used to access the landing. When this is not practical, grab rails will be installed.
- All ladders shall be equipped with safety feet.
- All straight and extension ladders shall be secured at the top to prevent movement.
- Ladders must not be placed against movable objects.
- Stepladders shall be fully opened to permit the spreader to lock. Never use them leaned against a wall or object.



### ***Fixed Ladders***

Permanent fixed ladders may be encountered at some facilities. Inspect these ladders prior to use for condition and the presence of a Competent Person inspection tag. If a ladder is not in good condition or presents other significant hazards, alternative means of access shall be provided.

## **FLOOR, WALL OPENINGS, AND STAIRWAYS**

### ***Floor Openings***



Floor openings shall be barricaded or securely covered to prevent accidental displacement. Label or mark all floor-hole covers, "HOLE" or "COVER" with 2-in. or larger letters.

If it is necessary to work inside the barricade around a floor opening, you must use approved secondary fall protection methods.

### ***Wall Openings***

Wall openings from which there is a drop of more than 4 ft, and where the bottom of the opening is less than 3 ft from

the working surface (floor), shall be guarded by a standard guardrail or equivalent.

Every open-sided floor or platform 6 ft or more in construction or 4 ft or more in industrial/operational areas above the adjacent floor or ground level must be guarded by a standard guardrail or equivalent.

***Stairways***

Every flight of stairs having four or more risers or rising more than 30 inches shall be equipped with a handrail.

**HOUSEKEEPING**

Housekeeping is a benchmark of an effective S&H Program. It is the responsibility of all employees to keep work areas clean. Good housekeeping practices reduce slip and trip hazards and fire hazards (accumulation of combustible material), and improve emergency egress capability.

- Keep walkways and doorways clear, unobstructed, and free of electrical cords, boxes, and equipment at all times.
- Scrap materials are fire and accident hazards. If an excess of these materials exists in your work area, notify your supervisor to arrange for their removal.
- Trash containers should be located throughout work areas and routinely emptied.
- Where hazardous substances are involved, it may be necessary to provide special labelled containers for each type of waste. Items such as bulbs, batteries, and aerosol cans should not be disposed in normal trash containers. If you need assistance, notify your supervisor or EC&P representative.
- Tools and materials should be placed where they will not create a hazard for others.
- Spilled liquids can cause safety or health problems and should be cleaned up immediately. If you need assistance, notify your supervisor.
- Toilets, wash facilities, and potable water are provided for your convenience and comfort. You are expected to help keep them clean and sanitary. Report any problems to your supervisor.
- Remove all protruding nails, staples, screws, or other objects from lumber or other building materials that present a hazard to employees or vehicles.



**MATERIAL HANDLING AND STORAGE**

Materials shall be properly stacked and secured to prevent sliding, falling, or collapse. Aisles, stairs, and passageways shall be kept clear for the safe movement of employees and equipment, and to provide access in emergencies.



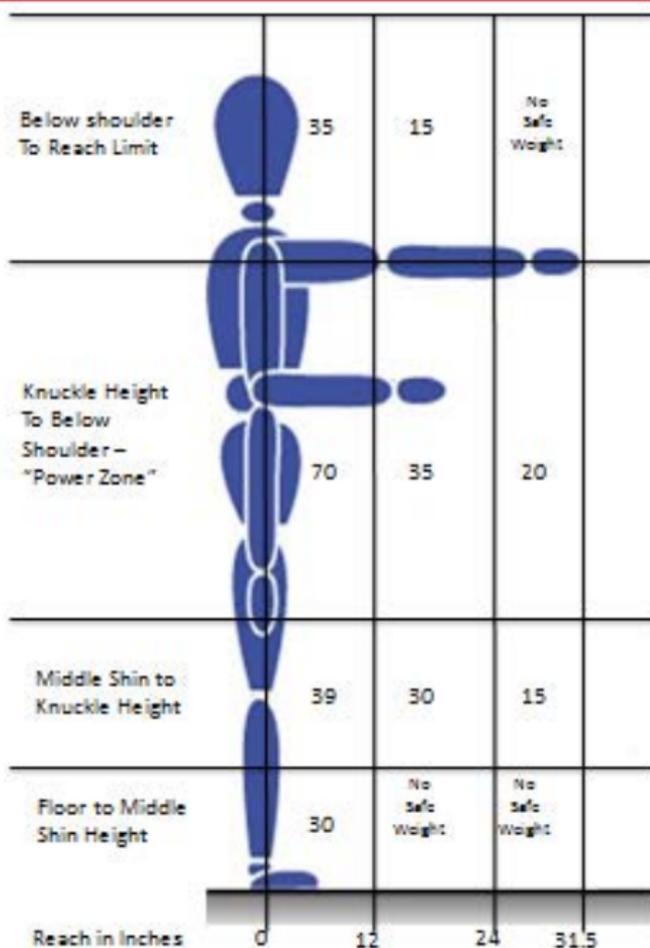
Use proper lifting techniques and body positioning when handling materials:

- Establish good footing before attempting to lift.
- Keep your back straight. Do not lean over.
- Bend your knees; get down close to the load.
- Lift gradually, using your legs. Do not jerk or twist.
- Get help for bulky or heavy loads.
- Whenever possible, try to use mechanical aids to reduce the amount of lifting you are required to do.



## ACGIH Lifting TLVs

If the weight being manually lifted exceeds the weights shown on this poster or involves awkward posture, then contact your S & H Representative for assistance.



All weights are in Pounds

### How to Use:

1. Identify the hand position at start and end of lift.
2. Determine the weight that corresponds to the start and end hand positions on the above figure.
3. The lower of the two weights corresponding to the start and end hand positions is the established ACGIH Threshold Limit Value.

**NOTE:** Notify your supervisor if you feel you cannot lift any item safely.

The following are additional material handling controls:

- Employees working overhead of other employees shall protect the employees below from overhead hazards (i.e. netting, toe boards, signs, or barricades).
- Material shall be raised or lowered, where applicable, in a canvas bag attached to a well wheel or manually by hand. Material that is larger than the bag shall be properly rigged or secured and raised or lowered one item at a time.
- Radios shall be secured in a radio holster attached to an individual's belt, clipped to the belt, taped securely, or attached to a lanyard.
- Employees shall establish barriers and signs when applicable with consideration for trajectory /bounce of falling material.
- If employees cannot be adequately protected, the Field Supervisor/Lead shall administratively control the falling object hazard by removing the employees from line of fire (below overhead work).

### ***Storage***

When storing materials inside structures, buildings, or towers under construction, you should place them:

- A minimum of 6ft away from any hoist-way or other inside floor opening.
- A minimum of 10ft away from any exterior wall that does not rise higher than the top of the material stored.
- Pipe, conduit, and bar stock should be stored in racks or stacked and blocked to prevent movement.
- Maintain a minimum of 18 in. of clearance from any fire sprinkler head. Nothing shall be attached or hung from fire sprinkler heads, lines, or equipment.

**FIRE PREVENTION AND PROTECTION**

Employees shall have basic knowledge of fire prevention procedures, fire classifications, and the appropriate extinguishing agents. When you see an event, flee to a safe location, notify others in the area, and call 9-1-1. Ensure the safety of all personnel before using the appropriate fire-fighting equipment (only if trained and can do so without placing yourself in danger) until help arrives.

**Fire Prevention Procedures**

Per PROC-FP-2006, *UCOR Program for Controlling Combustibles and Ignition Sources*, keep your work area neat and free of hazards. Combustible materials shall be removed from the area at the end of the work shift, or more frequently, if necessary.

Dispose of unnecessary combustible materials.

Combustible waste materials shall be stored in metal containers (55-gal drums, dumpsters, roll-offs, B-25 boxes, etc.) until removal/disposal.

Smoking inside UCOR buildings and facilities is prohibited. Discard smoking materials only when extinguished and in designated containers.

Only solvents identified in the JHA are to be used for cleaning and degreasing. The use of gasoline and similar flammable products for this purpose is strictly prohibited.

Flammable and combustible liquids shall be handled only in approved, properly labeled safety containers.

Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in appropriate, listed disposal containers (covered containers).

Do not attempt any work involving a source of ignition near a pit, sewer, drain, manhole, trench, or enclosed space

where flammable gases may exist or may have been present without Industrial Hygiene first performing an evaluation and verification.

Obtain appropriate approval and/or permits prior to starting any work task involving a source of ignition (Hot Work Permit).

Open fires are strictly prohibited.

### ***Fire Classifications***

***Class A—Ordinary combustible materials such as wood, paper, or cardboard:*** Water or dry chemical powder is a good extinguishing agent.



***Class B—Flammable liquids and gases, such as gasoline, solvents, paint thinners, grease, LPG, and acetylene:*** Dry chemical powder, foam, and CO<sub>2</sub> gas extinguishers work best on flammable liquid fires.



***Class C—Fires in energized electrical equipment:*** CO<sub>2</sub> and dry chemical powder extinguishing agents can be used on electrical fires. **Do not use water or foam, as they are electrical conductors.**



***Class D—Fires in combustible metals:*** A special extinguishing agent is required.

**Fire Classification Table**

Class	Extinguishing agents				
	Water	CO <sub>2</sub>	Foam	ABC dry chemical	Special agent
<b>A</b> —Wood, paper, and trash	X			X	
<b>B</b> —Flammable liquids, gasoline, oil, and paint		X	X	X	
<b>C</b> —Electrical		X		X	
<b>D</b> —Combustible metals					X

## **POWER AND HAND TOOLS**

### **General**

Tools shall be inspected daily prior to each use to ensure that they are in proper working order. Damaged or defective tools must be tagged and taken out of service immediately.



You must comply with the manufacturer's instructions.

Power saws, grinders, drill presses and other power tools shall have proper guards in place at all times.

All grinding wheels, wire brushes, and flapper wheels must be rated for the grinder on which they will be used.



Unplug electrical and disconnect pneumatic tools before performing maintenance or blade/bit changes.

Tools must never be hoisted, lowered, or carried by the cord.

To prevent employees from tripping and falling, cords, leads, and hoses must:

- Be placed out of walkways, and off stairs or ladders.
- Be secured a minimum of 7ft above walkways, runways, and ramps.

Appropriate PPE must be worn when using any tool. Avoid loose fitting clothing or gloves, rings, or other jewelry that can be caught when operating rotating equipment.

### ***Electrical Tools***

All portable electric tools shall be grounded, except those identified as double-insulated tools. All shall be Nationally Recognized Testing Laboratory (NRTL) listed or have been reviewed and approved by the electrical Authority Having Jurisdiction (AHJ).

Ground fault circuit interrupters (GFCI) shall be used when performing work using hand-held electrical tools. Consider battery-operated or pneumatic tools as an alternative to electrical tools in wet or damp locations.

### ***Pneumatic Tools***

- An approved safety check valve (excess flow valve) must be installed at the manifold outlet of each supply line for handheld pneumatic tools.
- All pneumatic hose connections shall be fastened securely.
- Safety clips or retainers must be installed on all pneumatic tools to prevent the accidental expulsion of the tool from the barrel.
- All bull hoses shall be secured with a safety chain or equivalent.



### ***Fuel-Powered Tools***

- All fuel-powered tools must be shut down and allowed to cool prior to being fuelled.
- Smoking is prohibited during refuelling operations.
- Other nearby sources of ignition, such as burning and welding, must also be halted during refuelling operations.
- Fuel-powered tools shall not be used inside a building or excavation without adequate ventilation.

**Tool Specific PPE**

When using the tools listed below or working near others using such tools, employees must use the PPE specified at a minimum.

<b>Jackhammers</b>  <b>Tampers</b>	Double eye protection <sup>1</sup>  Hearing protection  Foot protection (Metatarsal)  Hand protection  Anti-vibration gloves may be required (contact your supervisor)
<b>Chipping hammers</b>  <b>Impact wrenches</b>  <b>Reamers</b>	Double eye protection <sup>1</sup>  Hearing protection  Hand protection  Anti-vibration gloves may be required (see your supervisor)
<b>Cutting torches</b>  <b>Arc welders</b>  <b>Cadweld molds</b>	Double eye protection <sup>2</sup>  Hand protection  Flame-resistant garment
<b>Chain saws</b>	Hard hat  Face and eye protection  Hearing Protection  Hand Protection  Chain Saw Chaps- ASTM F1897  Chain Saw Boots- ASTM F1818
<b>Grinders<sup>3</sup></b>  <b>Hand-held chipping hammers</b>	Double eye protection <sup>1</sup>  Hand protection

<sup>1</sup> Full-face shield over safety glasses or mono-goggles.

<sup>2</sup> Burning goggles/welding hood over safety glasses. Lens shades may be found on P. 70 under Hot Work

<sup>3</sup> Flame-resistant outer garment.

## ***ELECTRICAL SAFETY***

All electrical equipment used as part of an electrical installation must be listed by NRTL for the specific application. All electrical installation must conform to the National Electric Code.



GFCIs must be utilized when using electrical hand-held tools energized from single-phase 15-, 20-, or 30-ampere receptacle outlets

Damaged or defective electrical tools must be removed from service, tagged, and dispositioned for repair or discard. Tampering with, or the unauthorized repair of, electrical tools or equipment is prohibited.



You must not work on energized circuits of any voltage unless you are a Qualified Electrical Worker (QEW), authorized, and adequate safety measures have been taken. The work operation must be reviewed and approved by your supervisor and Safety Representative (see the UCOR LO/TO Procedure).

If required to work on high-voltage (over 600 volts) energized lines and equipment, you must be appropriately trained and obtain prior approval from the appropriate supervisor. In addition, adequate PPE, such as eye protection, linemen's gloves, blankets, or mats, shall be used, as required.

Temporary lighting must have guards over the bulbs. Broken and burned-out lamps/bulbs must be replaced immediately. Bulbs shall not extend beyond the protective guards. Do not attempt to remove broken bulbs until the circuit is de-energized.

Circuit breaker switches shall be identified as to what they control.

Hazardous areas shall be barricaded and appropriate warning signs posted.

Downed power lines can create a special hazard. If you see a power line, guy wire, or communication line lying on the ground, LEAVE IT ALONE. Contact the PSS. Do your best, without injuring yourself, to keep people a minimum of 30ft away from the area until the proper personnel arrive to control the area.

**LOCKOUT/TAGOUT**

**All affected and authorized employees must be properly trained prior to performing duties as described in PROC-EH-2002, *Hazardous Energy Control (Lockout/ Tagout)*. You must follow UCOR's LO/TO procedure.**

The LO/TO Program is designed to prevent the accidental release of an energy source such as electricity, compressed gases, liquids, steam, rotating equipment, etc.

The LO/TO Program includes provisions for tagging, locking, blanking, capping, or blocking of moving mechanical parts and electrical systems to prevent accidental or unauthorized operation.

You must be familiar with the LO/TO Program for the work being performed.

Without the LO/TO, you are prohibited from working on or near electrical equipment or lines, mechanical equipment, or pressure systems that could be energized or activated; and on vessels, piping systems, or equipment containing toxic substances or hazardous material that could be activated or released.

Unauthorized removal of locks, tags, or other non-compliance with the project LO/TO procedure will be grounds for termination of employment.

**Never tamper with or  
remove someone  
else's Lock or Tag!**

**HEAVY EQUIPMENT HAZARDS**

- Work performed near heavy equipment (such as front-end loaders, backhoes, trenchers, cranes, bobcats, lift trucks, and haul trucks) requires special care and awareness.
- Equipment specific operator training is required.
- Heavy equipment has the right-of-way.
- Do not assume that the operator can see you.
- Never cross in close proximity to the forward or reverse travel path of heavy equipment. Establish confirmation with the operator prior to crossing.
- Do not depend on hearing a horn or an alarm to warn you that moving equipment is near.
- Wear high visibility/reflective safety apparel while working where this type of equipment is being operated.
- Never ride on the running board, steps, drawbar, or other part of any equipment, even for a short distance.
- Watch out for swinging counterweights on equipment. Never walk under loads or place any body part under loads suspended from cranes or hoists.
- Operators are required to wear their seat belts at all times when operating any piece of construction equipment.
- Never operate any equipment in a way that would exceed the manufacturer's rated capacity.
- Be aware of overhead obstructions, especially power and communication lines. Maintain a safe distance and utilize a "spotter" when necessary.
- Be aware of underground hazards such as voids or pits. Do not operate in areas or on surfaces incapable of supporting the equipment being utilized.



## **AERIAL LIFT DEVICES**

### ***Training***

**Only trained individuals who demonstrate competency in safe operation and/or possess an operator's card issued by a qualified/competent person shall be allowed to operate aerial lift devices.**

### **Trained employees SHALL:**

- Read and obey all warning signs, and become familiar with the operator's manual.
- Take adequate time to become familiar with and operate each specific aerial lift.
- Check the inspection tag to ensure that the inspection is current on the piece of equipment.
- Conduct a pre-start inspection of the equipment and document on the Daily Equipment Checklist.
- Operate the equipment on the terrain for which it is designed. (be aware of slopes and unstable surfaces)
- Only use lifts to hoist personnel and small hand tools. Additional lifting fixtures attached to an aerial lift must be approved in writing from the manufacturer.
- Stand on the platform floor. (Standing on the railing is prohibited.)
- Wear safety harness and tie off inside the lift to designated anchorage points to prevent ejection from the lift (i.e., JLGs).
- Keep hands off the outer handrail when the platform is in motion.
- Perform a Fall Protection Hazard Analysis if an aerial lift is to be used as a fall protection anchorage point for a worker to perform activities outside of the platform.

**Trained employees SHALL NOT:**

- Use a malfunctioning lift. Tag it out and promptly notify your supervisor.
- Overload platforms/baskets in excess of the design-working load with personnel and equipment.
- Tie the platform off to any structure for any reason.
- Rest the boom or basket on steel structures.

## MOTOR VEHICLE SAFETY

- When you are at the controls of any company vehicle, it is important to remember that defensive driving is a full-time responsibility. Per PROC-ET-4006, *Use of Government Vehicles*, when bad weather affects driving conditions, you must adjust your driving time and habits. Driving on wet or slippery roads is not the same as driving on dry surfaces.



- Stay a safe distance from the vehicle in front of you. Anticipate driving hazards and know how to protect yourself from them.

- Be alert while driving by keeping your mind free of distractions and your attention focused on driving; alertness involves watching and recognizing accident-causing factors instantly.

- Driver and **ALL** passengers must fasten their seat belts while conducting company business.

- Drivers of company vehicles must perform a pre-operation 360° check.



- Cell phone operation is prohibited while driving on company business. Pull over to the side of the road (safely out of the traffic), place the vehicle in a safe configuration, and set the parking break prior to using your cell phone or any of its features. Alternatively, wait until you reach your destination to operate the cell phone.

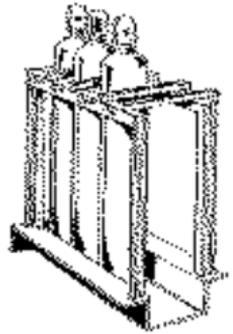
- Driving under the influence of drugs or alcohol is strictly prohibited.

- Operators must possess a current state driver's license.

## COMPRESSED GASES

### Use

- Handling of compressed gasses requires UCOR specific training.
- Per PROC-EH-2014, *Compressed Gas Cylinders*, always use the proper regulator for the type of gas in the cylinder.
- Attach the regulator securely before opening the valve. For oxygen, the valve is opened fully or wide; for acetylene, the valve should be opened only 1.5 turns. In either case, open the cylinder valves SLOWLY, and stand to the side of the regulator.
- The threads and mating surfaces of the regulator and hose connections should be clean before the regulator is attached.
- Always use a cylinder wrench or another tightly fitting wrench to tighten the regulator nut and hose connections.
- Do not use a wrench to open or close a hand-wheel-type cylinder valve. If it cannot be operated by hand, the valve should be repaired.
- Do not permit oil or grease to come in contact with cylinders or their valves. Oily substances may decompose explosively when exposed to oxygen.
- Regulators are to be removed and valve protection caps are to be in place when cylinders are not in use. Turn off all valves and gauges when not in use and disconnect hoses at the end of each shift.



### Storage

- Cylinders containing acetylene must never be stored on their side. They contain liquid acetone that could leak out of the

valves if cylinders are not kept upright. Cylinders should be stored in a well-ventilated area away from flames, sparks, or any source of heat or ignition.

- Keep cylinders away from electrical circuits.
- Do not store oxygen (or oxidizer) cylinders, full or empty, within 20ft of other flammable gases unless separated by a 5-ft-high barrier having a fire-resistant rating of at least 30 minutes.
- Never lift cylinders by the cap. The cap is for valve protection only.
- Cylinders should be properly secured at all times (attached to a wall, cylinder truck, cylinder rack, or post). Full and empty cylinders of all gases should be stored separately and identified by “Full” and “Empty” signs or tags.
- Hoses shall be disconnected from the manifold and stored properly after each shift. Do not store in confined areas (such as an unventilated gang box) where gasses may accumulate.

### ***Transportation***

- Cylinders shall never be rolled on their side or dragged. When moving large cylinders, strap them to a properly designed wheeled cart to ensure stability.
- Cylinders being transported shall have the regulators removed and valve protection caps securely in place.

## **HOT WORK OPERATIONS**

Welding, burning, and abrasive grinding operations have a potential to cause injuries and fires. When performing either task, it is essential to take the following precautions per PROC-FP-2008, *Hotwork*:

### **General Precautions**

- Obtain a Hot Work Permit.
- Special precautions must be taken to ensure proper ventilation when conducting hot work (especially in confined spaces). IH must evaluate ventilation to determine that airborne hazards are adequately controlled to prevent exposures from exceeding occupational exposure limits.
- When general mechanical or local exhaust cannot adequately reduce airborne concentrations below occupational exposure limits, approved respiratory protection shall be required when welding, cutting, or heating metals.
- All welding or burning work done outside an approved weld shop requires the presence of a dedicated fire watch trained to perform that function. The fire watch must be properly trained and shall stay on the job at least 30 minutes after the end of hot work.
- During Fixed Weld Shop operations, a second person trained to use a fire extinguisher (not necessarily a Fire Watcher) must be present in the vicinity to come to the welder's aid in the event of an emergency.
- Qualified personnel shall perform all welding, cutting, and grinding operations.
- Valves on fuel gas should not be opened more than 1-1/2 turns. If a special wrench is required for closing the valve, the wrench should be left in position on the stem at all times.



- Torches should be lighted by friction lighters or other approved devices only.
- Keep cylinders, all hose apparatus, and connectors free of oil and grease, and do not handle them with oily or greasy hands or gloves.
- Oxygen/fuel gas systems will be equipped with approved backflow valves, flash arresters, and pressure relief devices.
- When performing hot work, you must wear prescribed PPE (including flame-resistant garments in some cases). Do not wear synthetic (polyester, polyester blends, etc.) type clothing when performing hot work operations.
- Before conducting hot work, inspect your work area to ensure that sparks or molten metal will not contact flammable or combustible materials. Combustible material must be covered or moved 35 ft away from the work. Flammable liquids and gasses, not associated with the work, must be moved 50 ft away.
- You must be sure that suitable fire protection equipment is available in your work area.
- Welding leads and burning hoses shall be maintained off floors, walkways, and stairways to prevent tripping hazards.
- When burning, grinding, or welding on coated surfaces, special precautions need to be taken. The coating must be removed—at least 4 in. in every direction around the weld area. Contact your supervisor and IH for further information.



- Never weld or burn on barrels, tanks, piping, vessels, or other systems that may have contained either combustible or unknown products without first obtaining clearance from your supervisor.

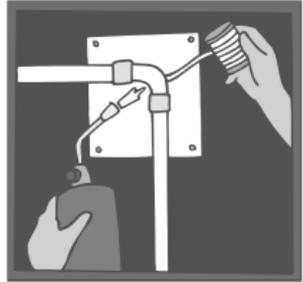
- **Filter lenses** provide protection from light radiation sources such as arc welding or lasers. Filter lenses must have a shade number that is appropriate for the work being performed.

**Filter Factor Table**

<b>Conditions</b>	<b>Shade no.</b>
Shielded metal-arc welding: 1/16-, 3/32-, 1/8-, 5/32-in. diameter	10
Gas-shielded arc welding (nonferrous): 1/16-, 3/32-, 1/8-, 5/32-in. diameter	11
Gas-shielded arc welding (ferrous): 1/16-, 3/32-, 1/8-, 5/32-in. diameter	12
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-in. diameter electrodes	12
Shielded metal-arc welding: 5/16-, 3/8-in. diameter electrodes	14
Atomic hydrogen welding	10 to 14
Carbon arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting: up to 1 in.	3 or 4
Medium cutting: 1 to 6 in.	4 or 5
Heavy cutting: over 6 in.	5 or 6
Gas welding (light): up to 1/8 in.	4 or 5
Gas welding (medium): 1/8 to 1/2 in.	5 or 6
Gas welding (heavy): over 1/2 in.	6 or 8

## ***Welding***

- Your supervisor and Safety Representative must approve the use of soft hoods for specific operations.
- Employees must utilize double eye protection (maintaining a face shield and glasses/goggles) when encountering flying objects from grinding or other weld-cleaning activity.
- When arc welding near other workers, workers must be protected from the arc rays by non-combustible screens and/or filter lenses that reduce the transmission of ultraviolet rays.
- The frames of welding machines shall be grounded.
- Special precautions shall be taken during TIG or MIG welding operations to ensure that inert gases do not collect in adjacent low-lying areas or confined spaces. Contact your supervisor for special precautions.



## ***Burning and Cutting***

- Inspect equipment prior to use. If repair or replacement is necessary, return the equipment to the tool room.
- Do not use matches or lighters to ignite torches. Friction igniters must be used.
- Torches shall not be used to light smoking materials.
- Flashback arrestors shall be installed on all cutting torches prior to use.
- Do not use oxygen to blow off clothes or clean welds.
- Air arcing will require hearing protection.
- Turn off all valves and gauges when not in use, and disconnect hoses at the end of each shift.



***Off-the-Job Safety***

UCOR is equally concerned with the off-the-job safety of our workers. More injuries and fatalities happen off the job than at work. Please use the rules of safety you have learned while working in our facilities when you are away from work, and share them with your family.



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**Notes**

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**Notes**



**UCOR**  
URS | CH2M  
Oak Ridge LLC

**Safety & Health Handbook**

**DETACH HERE ↑**

**Please complete and return to your supervisor.**

**Company** \_\_\_\_\_

**Date** \_\_\_\_\_

**I acknowledge my responsibility to have read and reviewed the contents of this handbook.**

**I agree to follow the practices outlined in this handbook while working on this project.**

\_\_\_\_\_  
**(Print) Last Name, First Name, Initial**

**Signed** \_\_\_\_\_

**Badge #** \_\_\_\_\_



**EMERGENCY SIGNALS****Standard Alerting Tone on Radios:**

Signal: High/Low wavering tone  
 Action: Standby for information from the Park Shift Superintendent (PSS)

**Criticality Accident Alarm:**

Signal: Continuous, steady tone  
 Action: Exit the area as quickly as possible and go to the nearest Assembly Station

**Instructions for Emergency Reporting:**

Use the fire alarm box to summon help for any emergency. Emergency response personnel will respond to the **location** of the fire alarm box, so if safe, stand by the alarm box, and provide information to the emergency response people when they arrive.

Use the phone numbers below to report on-site emergencies at each location:

<b>Location</b>	<b>1<sup>st</sup></b>	<b>2<sup>nd</sup> (land or cell)</b>	<b>Radio Ch.</b>
ETTP	911 (land or cell)	PSS 574-3282	Ch. 1
ORNL	911 (land only)	LSS 574-6606	Ch. 1
Y-12	911 (land only)	PSS 574-7172	Ch. 2
At ORNL and Y-12 cell calls to 911 will slow response since the call will have to be re-routed from city/county service to PSS/LSS response.			

**Note:**

Individuals not normally scheduled to work on-site between 6:00pm and 6:00am on weekdays or anytime on weekends or holidays must notify the PSS upon arrival and departure.

**Information:**

For information on road closures, inclement weather, or schedule changes, **do not** call the PSS. Call

ETTP: 241-INFO (241-4636)

Y-12: 241-1212

ORNL: 574-9836

